EGG-WM-8986
September 1991

Idaho
National
Engineering
Laboratory

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Department
of Energy

INFORMAL REPORT

FINAL REPORT
Soil Overburden Sampling at the RWMC Transuranic Storage Area

R. G. Schwaller

EG&G Idaho

Work performed under
DOE Contract
No. DE-AC07-76ID01570

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TRANSURANIC STORAGE AREA

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Prepared by the
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Prepared for the
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Field Office, Idaho
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NOTE: The master copy of this report is located at the EG&G Idaho Environmental Restoration Program (ERP) Administrative Records and Document Control (ARDC) Office.

ABSTRACT

The purpose of the Transuranic Storage Area (TSA) overburden sampling task was to characterize the TSA waste stack overburden and sideburden soil for selected contaminants. Methods used to characterize the soil were based on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidance. A field screening procedure with the portable gas chromatograph was used to determine areas most likely to be contaminated. The gas chromatograph detected transient vapors of volatile organic compounds near the oldest cells of the waste stack. This was followed by the collection of samples for laboratory analysis. Results of the laboratory analysis showed that all of the soils tested were below detection limits for contaminants sought. The conclusion of this report states that the soil is uncontaminated (below action levels) with respect to contaminants of concern and may be excavated with continuous real-time monitoring to ensure worker health and safety.

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ACRONYMS AND ABBREVIATIONS

A-E	architecture-engineering
ARDC	Administrative Records and Document Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
GC	gas chromatograph
ID	identification
IEDMS	Integrated Environmental Data Management System
IH	industrial hygienist
INEL	Idaho National Engineering Laboratory
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RML	Radiation Measurements Laboratory
RWMC	Radioactive Waste Management Complex
SMO	ERP Sample Management Office
TRU	transuranic
TSA	Transuranic Storage Area
USCS	Unified Soil Classification System
VOCs	volatile organic compounds
WIPP	Waste Isolation Pilot Plant

1. INTRODUCTION

This report summarizes results from the Radioactive Waste Management Complex (RWMC) Transuranic Storage Area (TSA) stored waste stack soil overburden sampling task, compares the results to the action levels, and provides recommendations in response to these findings. Section 1 of this document provides background information and describes the scope and objectives of the soil sampling investigation.

1.1 Purpose and Scope of Report

This report addresses results from the TSA soil sampling task performed during the months of February through May of 1991. The intent of the field characterization is to determine whether the overburden soil has become contaminated, identify the type (radiological and/or chemical) and extent of the contamination. The data obtained by this investigation will: 1) ascertain if the contaminants from the waste stack have migrated into the overburden soil, 2) promote more accurate planning of cost and schedule, and 3) facilitate preparations to safeguard the workers and environment while removing soil for the foundation construction of the TSA Retrieval Enclosure. Also, these results established a baseline database by which future soil analysis will be compared. The following topics are addressed in the order shown below:

- Scope of the TSA field investigation.
- TSA waste stack background information.
- Details of the physical characteristics of the study area.
- Description of the study area investigation, including field activities.

- Nature and extent of any contamination. This includes the comparison of the validated data to the established action levels.

- Data limitations and recommendations for future data collection.

- Recommendations for excavation and disposition of the overburden soil.

1.2 Site Background

This section provides background information for the RWMC TSA stored waste stack as it relates to this field characterization.

1.2.1 Site Description and History

Since 1970, the RWMC at the Idaho National Engineering Laboratory (INEL) (see Figure 1) has accepted over 65,000 m^3 of defense-generated and other transuranic (TRU) waste for interim 20-year retrievable storage. Waste in boxes and drums is stored in "cell" configurations on adjoining, aboveground asphalt pads at the TSA (see Figure 2). There are eight cells in TSA-1, three cells in TSA-2, and three cells in TSA-R. Figure 3 shows the location of these cells.

When a storage cell reached its waste volume limit, the waste containers were topped with plywood and polyvinyl sheeting, followed by a minimum of 2 ft of soil cover above the highest container of the cell. Soil depth over the remainder of the containers may exceed 4 ft. Sideburden soil was added to reduce grade angle. The depths of the sideburden soil average approximately 16 ft at the edge of the stored waste containers. There is a potential that some breaching of waste containers has occurred, with the possibility of contaminant migration into the overburden/sideburden soil. The underlying soil is assumed to be protected from contaminant migration by asphalt pads, although the current condition of the asphalt has not been assessed. Prior to the TSA soil sampling task, visual inspections and routine instrument surveys

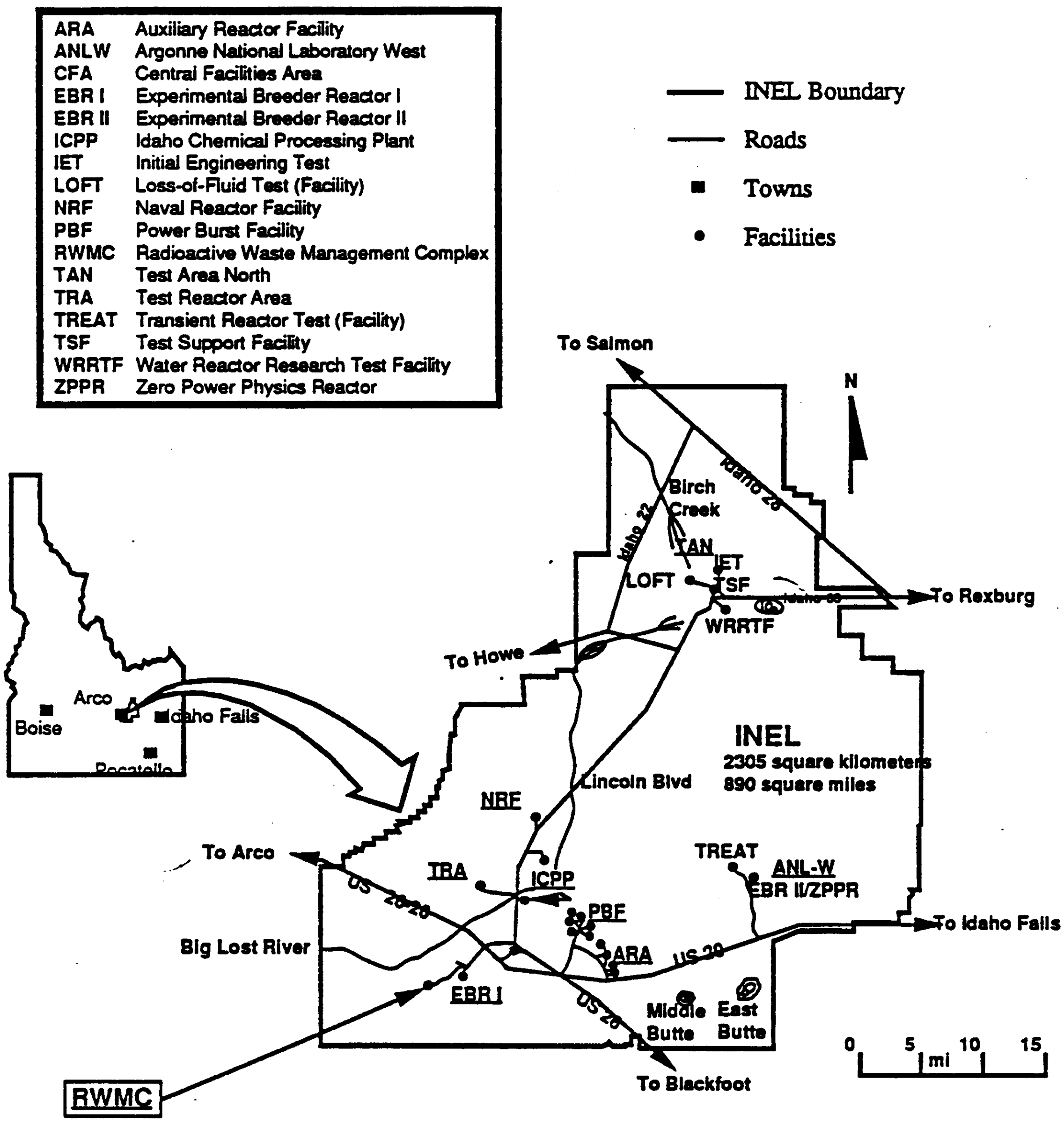

Figure 1. Map of the INEL showing the location of the RWMC.

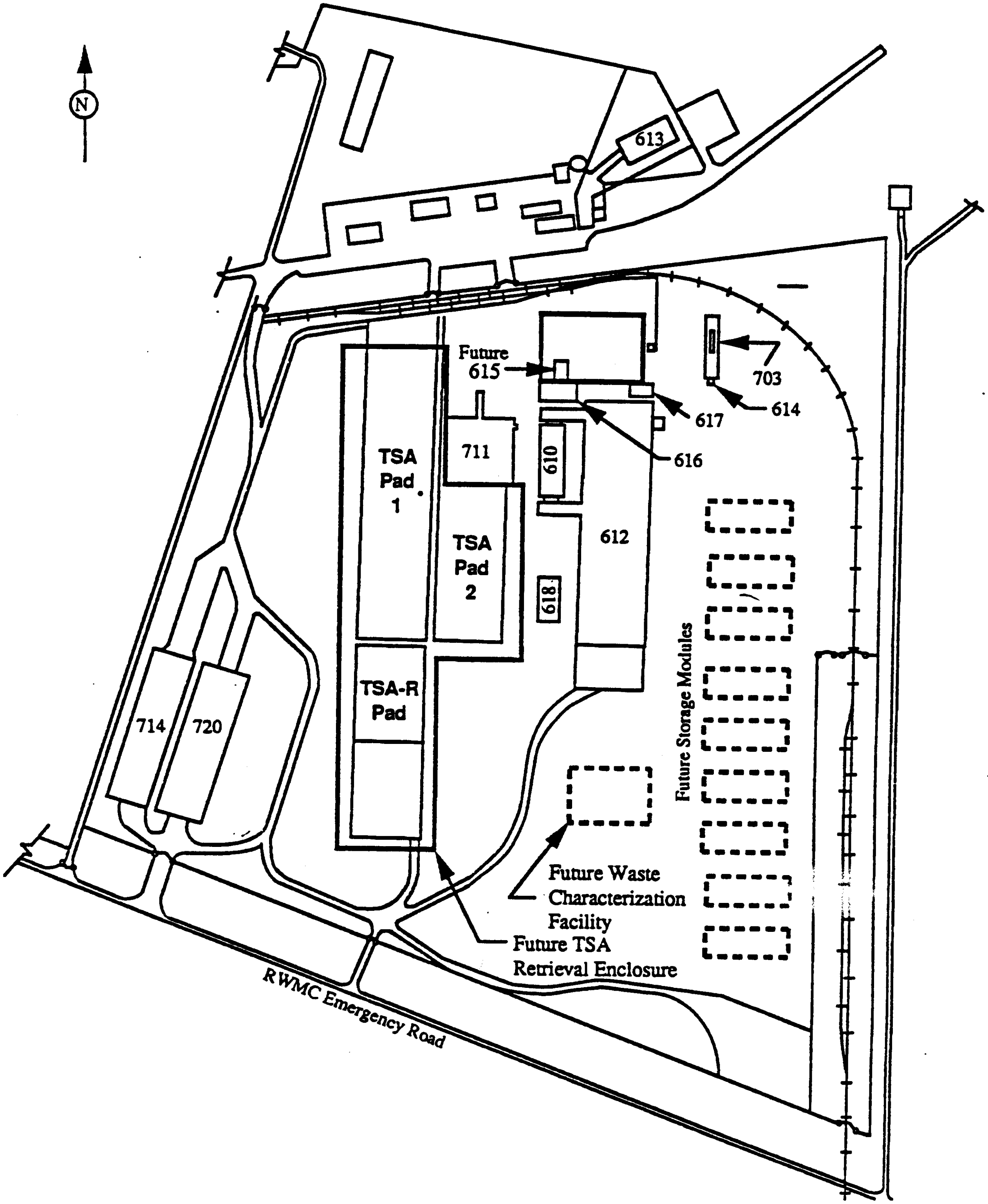

Figure 2. Map of RWMC showing the location of the TSA Pads.

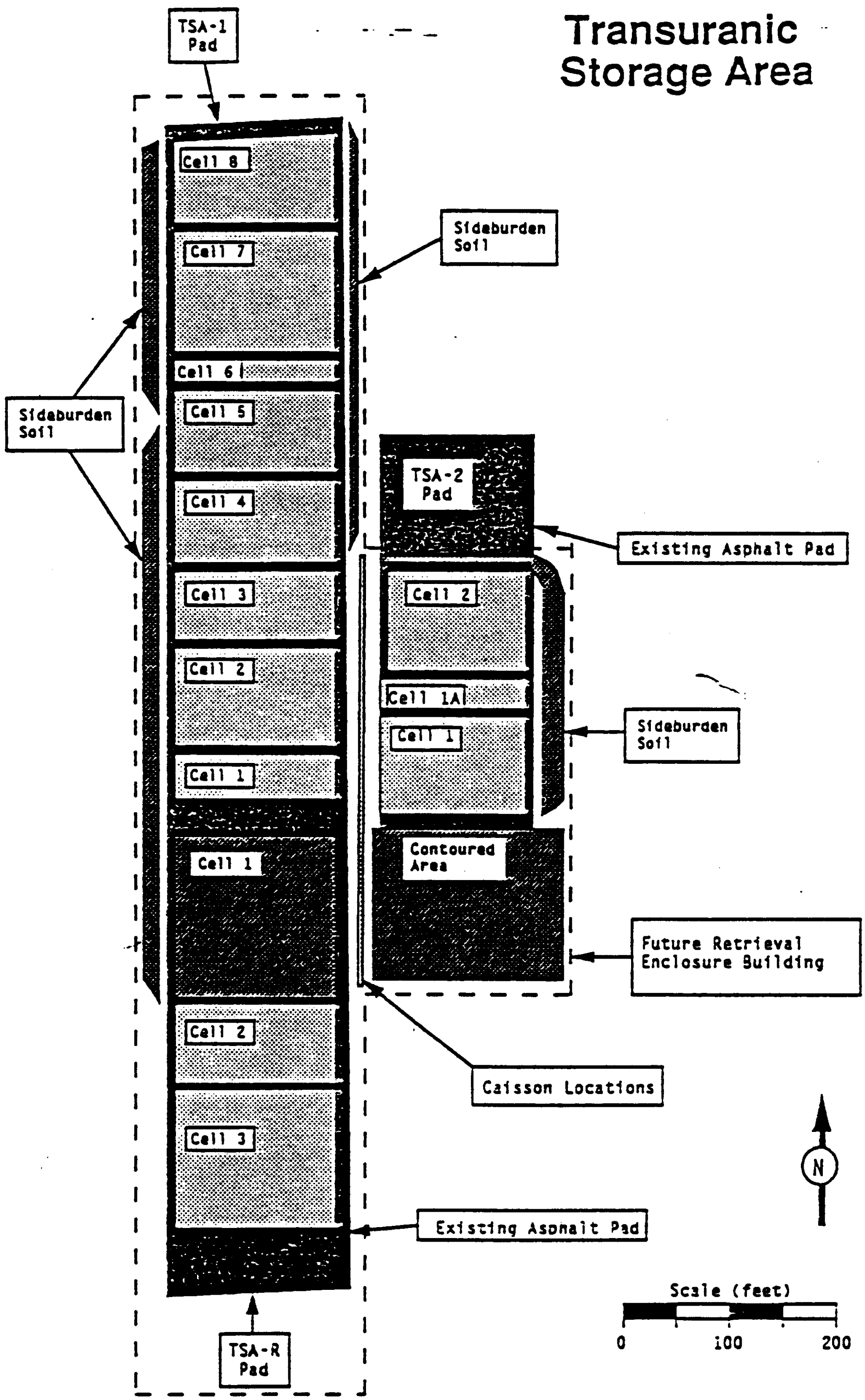

Figure 3. Location of cells within the TSA Pads.

have not detected any contamination in the cell areas overlain by soil. However, a spill of TRU contaminated material from containers stored on TSA-R pad is known to have occurred. The suspect containers, located in cell 3, are not covered with soil, and therefore the spill was readily contained and stabilized.

1.2.2 Future Site Objectives

The Department of Energy (DOE) Nuclear Waste Management Program's objective is to remove all retrievable stored waste from the INEL and send it to the Waste Isolation Pilot Plant (WIPP) in New Mexico. The TSA Retrieval Enclosure Project has been implemented to provide a structure and equipment to safely retrieve the waste containers presently stacked in the TSA. This project is described in the EG&G Idaho Architecture-Engineering (A-E) document, *A-E Conceptual Report, TSA Retrieval Process*[a]; the specifications for the building are found in *A-E Advanced Conceptual Report, TSA Retrieval Containment Building*.[b]

Prior to beginning construction of the waste retrieval building, the TSA soil overburden was characterized to determine if the soil is contaminated and to what extent. The soil sampling and analysis plan that guided the field sample collection and laboratory analysis was the *Soil Sampling Plan for the Transuranic Storage Area Soil Overburden*.[c]

a. *A-E Conceptual Report, TSA Retrieval Process*, Project File #020147R, EG&G Idaho, Inc., January 1990.

b. *A-E Advanced Conceptual Report, TSA Retrieval Containment Building*, Project File #020147, EG&G Idaho, Inc., October 1989.

c. Hardy, C. K., Pickett, S. L., and Stanisich, S. N., *Soil Sampling Plan for the Transuranic Storage Area Soil Overburden*, EG&G-WM-8986, Idaho National Engineering Laboratory, Idaho Falls, Idaho, March, 1990.

1.2.3 Previous Investigations

Surface radiation surveys and air monitoring for radioactive particulates at the TSA are routinely performed by RWMC Health Physics personnel. The site investigation performed this spring was the first field study of the TSA soil overburden that sampled and analyzed the soil for contaminants.

2. STUDY AREA INVESTIGATION

This section describes the TSA waste stack and the soil sampling investigation.

2.1 Physical Characteristics of the TSA Study Area

To adequately describe the soil types and conditions on the TSA waste stack, the process by which the soil surrounding the waste was originally placed must be described. Information on this process was gained by verbal communication with RWMC personnel as follows:

> "Soil used to cover the waste was excavated from a borrow area about 400 yd south of the TSA and outside of the RWMC fence. The soil was excavated using large earthmoving equipment (scrapers) and then transported to the TSA waste stack. The scrapers dumped the soil evenly on the top of the waste stack, and it was further spread and compacted with a tracked loader."

Soil in the borrow area typically consists of eolian silts with increasing clay content to the basalt bedrock. The basalt bedrock varies from surface exposures on higher ground to about 25 ft below the ground surface in the lower areas.

Areas of the TSA cover soil reflect the variation of the soils in the borrow area. By inspection, at least 90% of the soil would classify under the Unified Soil Classification System (USCS) as ML-CL (clayey-silt of low plasticity) and the remaining 10% or less would be CL (lean clay). A few areas have relatively high compaction, but the typical unit weight of the soil is estimated to be 95 lb/ft^3. Soil moisture content of the soil during the field sampling was estimated to be less than 5%.

The top surface of the waste stack is relatively flat and with very little slope. The sideburden soils have slopes of typically 1.5(horizontal):1(vertical), although some small areas have held nearly vertical slopes for several years.

Vegetation on the TSA waste stack was sparse and typical of the INEL. Vegetation communities at the INEL are typical of the sage brush steppe/cold desert ecosystem. Big sagebrush and rabbitbrush are common in most native communities of the INEL. Other locally important shrubs include winterfat, shadscale saltbush, Nuttall's saltbush, and gray horsebrush. Bottlebrush squirreltail, needle-and-thread grass, giant wildrye, bluebunch wheatgrass, thickspike wheatgrass, and bluegrass are the most abundant grass species.[a]

2.2 Soil Sampling Investigation

The general areas of interest for the field sampling were as follows:

- Sideburden soils on the west side of TSA-R, the west and east sides of TSA-1, and the east and north sides of TSA-2

- Soil in the caisson area between TSA-1 and TSA-2

- Soil comprising the "contoured area" south of TSA-2

- Overburden soil on TSA-R, TSA-1, and TSA-2.

The reasons these areas are of interest are as follows. Sideburden soils must be removed in most areas to provide room for construction of the TSA Retrieval Enclosure foundation. The soil in the caisson area between TSA-1 and TSA-2 will be drilled with a 5-ft auger during installation of the support caissons. Soils located in the "contoured area" and a large portion

a. McBride, R., French, N. R., Dahl, A. H., and Detmer, J. E., *Vegetation Types and Surface Soils of the Idaho National Engineering Laboratory Site*, IDO-12084, 1978.

of the soil on top of TSA-R will also be removed prior to construction of the retrieval enclosure. The remaining overburden soil was characterized to provide current site information and a data base for future retrieval operations.

The investigation was conducted in two phases. Phase I consisted of collecting samples for analysis of soil vapor headspace using the field gas chromatograph (GC). Phase II consisted of collecting and shipping soil samples to offsite laboratories for radiological and chemical analyses. The contaminants sought are believed to be the most reasonable indicators of any contamination at the site based on the site history and waste inventory.

2.2.1 Phase I - Gas Chromatograph (GC) Sampling and Analysis

Soil samples were collected for field GC headspace analysis at 174 initial locations. These locations are identified as SS#1, SS#2, SS#3,. . . etc. Figure 4 shows the sample locations on the TSA waste stack. The original full-size drawing is located at the EG&G Idaho Environmental Restoration Program (ERP) Administrative Records and Document Control (ARDC) office. Results from the GC analysis were used to determine appropriate locations for collecting samples for offsite laboratory analysis.

Approximately 500-mL samples collected for field GC analysis were placed in 1-gal sealed plastic bags. Following collection, the samples were either taken to the GC for immediate analysis or further sealed with tape and refrigerated at 4°C for later analysis. All GC samples were analyzed within a week of collection. The samples were allowed to come to room temperature before the headspace air in the bag was analyzed.

2.2.2 Phase II - Collection of Samples for Laboratory Testing

The soil samples for offsite laboratory analysis were collected at points within 2 ft (horizontally and vertically) of selected initial GC sample locations. Additional soil samples for field GC headspace analysis were collected simultaneously with the laboratory samples for later comparison.

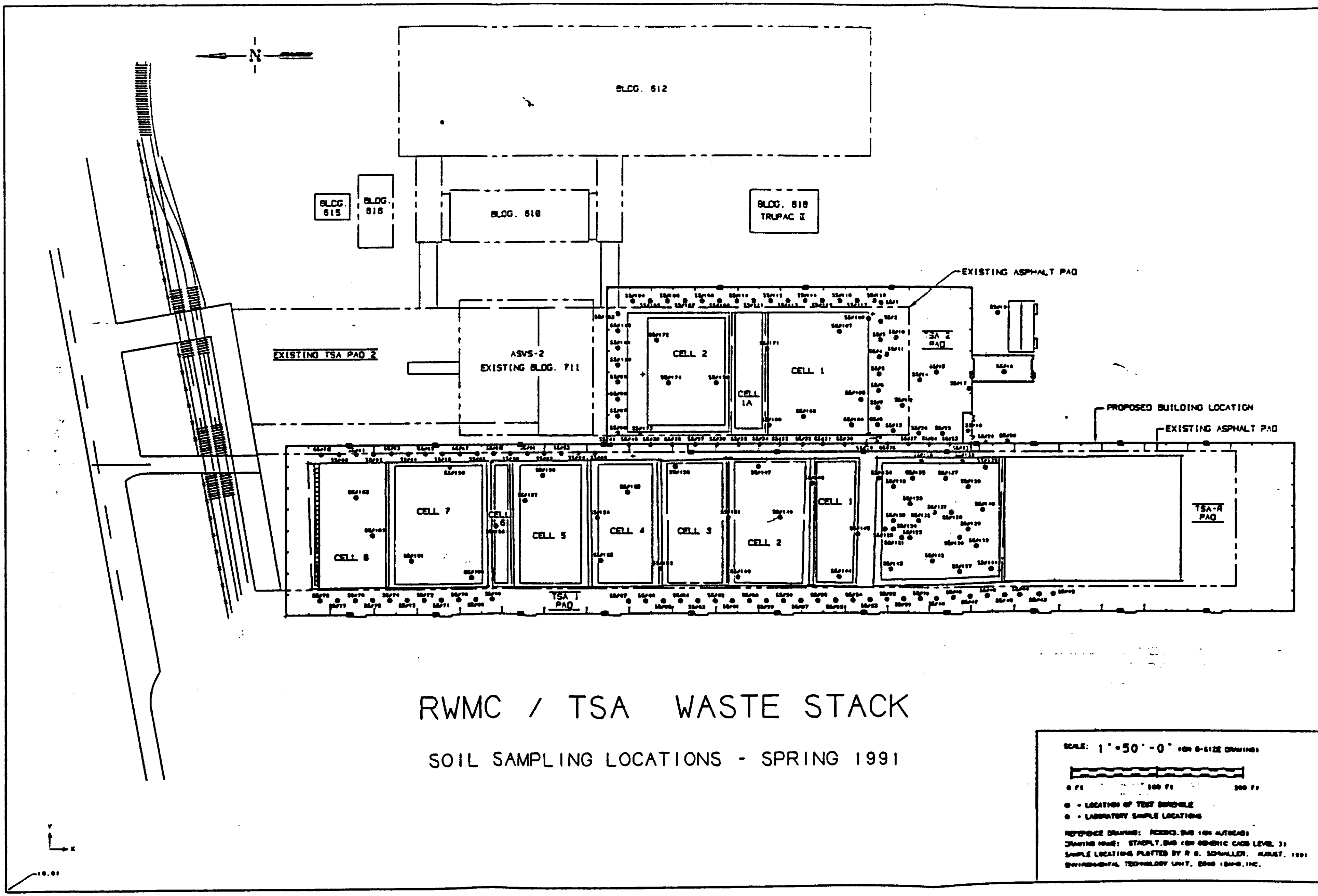

Figure 4. Soil sampling locations at the TSA waste stack.

A total of thirteen locations were selected for laboratory sample collection. The locations were selected either because they yielded positive results with the field GC screening or they represented a typical section of the TSA waste stack due to their location. The laboratory sample locations are designated with an "L" at the end of the location number, i.e. SS#16L, SS#30L, etc.

Samples sent offsite were analyzed for volatile organic compounds (VOCs), metals, polychlorinated biphenyls (PCBs), and radionuclides by gamma spectroscopy. Argonne National Laboratory-East performed the offsite analyses for chemical constituents and the INEL Radiation Measurements Laboratory (RML) performed the radiological analysis. Sampling procedures were dictated in the soil sampling plan[a] and conform to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sampling guidance recommendations.

2.2.3 Onsite Monitoring for Radionuclides and VOCs

Continuous air monitoring for radionuclides was performed by the RWMC Health Physics technician (HP) immediately downwind of all drilling and sampling activities. All soil samples were screened with a Ludlum 2A for gamma activity and a Ludlum 61 for alpha particles. Smears were taken on all equipment that contacted the soil during drilling and sampling and were counted with a scaler instrument (NMC DS33 proportional counter converter) for total activity. These field screening/monitoring activities did not detect the presence of any radioactivity greater than normal INEL background levels (typically less than 100 counts/minute with a Ludlum 2A). RWMC Health Physics provided a report of the monitoring activities and results for the TSA soil sampling task. That report (found in Appendix A) supports the conclusion that no radiological contamination was detected in the overburden soil.

Boreholes in the support caisson area between TSA-1 and TSA-2 were checked for volatile organic vapors with an HNu photoionization meter. The

a. Hardy, C. K., Pickett, S. L., and Stanisich, S. N., *Soil Sampling Plan for the Transuranic Storage Area Soil Overburden*, EG&G-WM-8986, Idaho National Engineering Laboratory, Idaho Falls, Idaho, 1990.

boreholes in the caisson area were selected for HNu screening since the RWMC Industrial Hygienist (IH) reasoned that the sampling personnel had the greatest risk of exposure from drilling in this area. This was because samples were collected at the asphalt pad level and were very close to the waste stack on TSA-2. The HNu probe was positioned about 2 ft from the top of each borehole checked. HNu readings for the support caisson area are shown in Table 1 and indicate the presence of low levels of VOCs in the soil gas.

Table 1. HNu readings at caisson locations recorded in the TSA Logbook #1[a]

Location	HNu Reading (ppm)
SS#31	4
SS#32	14
SS#33	1
SS#35	4
SS#36	5

An organic vapor badge was placed in SS#32 overnight and sent to the laboratory for analysis the following day. The badge was placed just inside the covered sampling borehole. Carbon tetrachloride was detected at a concentration of 5.3 ppm. Lesser concentrations of benzene, trichloroethene, chloroform, and perchloroethene were also detected. The results and calculations provided by the RWMC IH are found in Appendix B. The results confirmed the presence of organic vapors in borehole SS#32, as detected by the HNu.

a. *INEL RCRA/CERCLA Investigations Sample Logbook (#ERP-294-90)*, TSA Site Logbook #1, February 26 - April 22, 1991.

3. NATURE AND EXTENT OF CONTAMINATION

This section addresses data validation and the results of the field screening and laboratory analysis for both chemical and/or radiological contamination at the TSA waste stack. The GC field screening results are shown in Appendix C. Detailed laboratory results are presented in Appendix D and Table 2. A summary of the results are reported below.

3.1 DATA VALIDATION

This section discusses validation of the field GC and the offsite laboratory data.

3.1.1 Field GC Data Validation

The data for the field GC were reviewed by EG&G Idaho Environmental Technology Unit personnel. The validation performed ensured that the values used for interpretation of the field GC data were representative of the samples and not ambient conditions, calibration gases, or spiked samples. The field GC was calibrated frequently and stayed within calibration. The field GC data quality was sufficient for screening purposes.

3.1.2 Offsite Laboratory Data Validation

Data from the offsite laboratory were validated by the EG&G Idaho Environmental Restoration Program (ERP) Sample Management Office (SMO). A level B validation was performed. Checks were made for chain of custody, requested versus reported analyses, analysis holding times, method blank analysis, matrix spike/matrix spike duplicate analysis, duplicate analysis, internal standard areas, and surrogate recoveries. The data was useable and valid with the exception of some where VOC samples exceeded holding times.[ab] Data validation reports are located at the ERP ARDC.

3.2 Chemical Contamination

The portable GC detected trace levels ranging from 0.01 to 19.48 ppm of VOCs in the air headspace of the soil samples collected at several locations on the TSA waste stack. Laboratory tests of the soils found VOC concentrations to be above the detection limits in some cases but below the action levels established in the soil sampling plan.[c] The laboratory results for metals were similarly below action levels. The laboratory did not detect the presence of PCBs. The analyses and results are further discussed in the following sections.

3.2.1 Inorganic Compounds

Soils samples were collected for analysis of metals by EPA method 6010 (inductively coupled plasma) and EPA method 7471 (mercury by cold vapor, atomic absorption spectroscopy). The sampling locations were biased to locations where relatively elevated concentrations of volatile organic compounds were detected by the field GC. Biased samples were collected in an effort to detect the highest concentrations of metals in the soils. The greatest concentrations of VOCs were thought to have the potential for the

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a. Letters from R. D. Grant to W. R. Paskey, EG&G Idaho Interoffice Correspondence, Letters RG-132-91 through RG-136-91, RG-138-91, Subject: "Validation of...Data from the 1990 Sampling Effort of Transuranic Storage Area Soil Overburden Sample Delivery Group Number...," September 11-12, 1991.

b. Letters from R. J. Sheehan to R. G. Schwaller, EG&G Idaho Interoffice Correspondence, Letters RJS-25-91, RJS-26-91, and RJS-28-91, Subject: "Level "B" Validation for the Transuranic Storage Area Pads Project, Inorganic Analysis, Delivery Group Number...," September 11-12, 1991.

c. Hardy, C. K., Pickett, S. L., and Stanisich, S. N., *Soil Sampling Plan for the Transuranic Storage Area Soil Overburden*, EG&G-WM-8986, Idaho National Engineering Laboratory, Idaho Falls, Idaho, 1990.

highest concentrations of metals in the soils. Any leaks from the waste containers could contain the whole range of contaminants sought.

The results of this analysis were compared to concentrations of metals in undisturbed soils near the RWMC. Ten soil samples were collected to establish a range of background concentrations of metals that occur naturally in soils. The upper range of background was established using the data collected from the background samples and standard statistical techniques. The range of background was estimated using the upper 99 % percentile with 99% confidence.[a] This upper range of background (the highest estimated concentration of a specific metal) was then compared directly to concentrations detected at the biased sampling locations. All concentrations of samples collected from the TSA were less than the estimated upper range of background.

Some concentrations of metals naturally occurring in soils were less than the detection limit of the analytical methods used. When this was the case, tolerance limits could not be calculated because a range of concentrations was not established. Instead, the concentration was noted as being less than or equal to the detection limit. In these cases, the results of the TSA samples were compared to the maximum detection limit for the background samples. Detection limits of soil samples vary slightly between samples. All of the samples collected from the TSA were less than or equal to the maximum detection limit of the background soils.

The soil samples collected at biased locations indicated that the concentration of metals in soils from the TSA were similar to concentrations that are found naturally. It can be concluded that the TSA overburden soils are free of metals contamination.

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a. Crow, E. L., Davis, B. D., and Maxfield, M. W., *Statistics Manual*, Dover Publications, Inc., New York, 1960.

3.2.2 Volatile Organic Compounds (VOCs)

Samples were collected for analysis of volatile organic compounds by EPA method 8240. These samples were collected to verify the results of the portable GC analysis. Although the two methods and media are quite different, the target compounds (VOCs) were the same. The GC method determined the concentration of VOCs in air in the container headspace above the sample. The 8240 method uses Gas Chromatography/Mass Spectroscopy to determine the concentration of VOCs absorbed or adsorbed to the soil. Seven different VOCs were detected at low concentrations in some soil samples. Methylene chloride (one detection), acetone (one detection), 1,2-dichloropropane (one detection), trichloroethene (two detections), tetrachloroethene (one detection) , toluene (four detections) and xylene (three detections) were the compounds detected. The highest concentration detected was 51 ug/kg of methylene chloride. This common laboratory contaminant was found in only one sample. The other detections were less than 8 ug/kg. All detections were qualified with a "J" by the SMO indicating that the concentrations were estimates, but the identification of the compound is confirmed. The detections of xylene may be false positive because of xylene detections in the rinsate sample. The methylene chloride detection may be biased high because of methylene chloride detections in one trip blank. Holding times were exceeded on all but three samples and raises the concern that VOCs were originally present but not detected (false negatives).

The analysis by method 8240 indicates that low concentrations (0-10 ppb range) of various VOCs are present and appear to be only in isolated areas. Generally this correlates well with the results of the GC method.

3.3 Radiological Contamination

Based on the laboratory data from the INEL Radiation Measurements Laboratory (RML), the sideburden and overburden soils do not contain any contamination from radionuclides in levels above background. The presence of Cs-137 was noted at trace levels (the highest was 0.12 pCi/gm) and is attributed to worldwide nuclear fallout, which is present in the INEL soils. Typical concentrations of Cs-137 in INEL soils, due to fallout, are 0.8 pCi/gm, but can vary by a factor of two.[a] A copy of the RML report is shown in Appendix E.

Table 2. Results of the laboratory analysis for radiological contamination

Sample ID	RML ID	Manmade Radionuclides	Activity (T) (pCi/gm)
TSA1401G	D2040391025	None Detected	N/A
TSA1402G	D1041291030	None Detected	N/A
TSA1403G	D3042591024	None Detected	N/A
TSA1501G	D1040391024	Cs-137	(1.1±.3)E-01
TSA1502G	D2040391022	Cs-137	(1.2±.2)E-01
TSA1503G	D1040391022	None Detected	N/A
TSA1504G	D1041591025	None Detected	N/A
TSA1505G	D2041291031	None Detected	N/A
TSA1506G	D2042591023	None Detected	N/A
TSA1507G	D1042591022	None Detected	N/A
TSA1508G	D3042691028	None Detected	N/A
TSA1509G	D3042591034	Cs-137	(4.0±.8)E-02
TSA1510G	D1042591028	None Detected	N/A
TSA1901G	D1042691027	None Detected	N/A

a. Letter from T. J. Haney to R. G. Schwaller, EG&G Idaho Interoffice Correspondence, Letter TJH-47-91, Subject: "Gamma Analysis of Sixteen TSA Soil Overburden Samples," May 10, 1991.

4. SUMMARY AND CONCLUSIONS

This section discusses the limitations of field and laboratory measurements, compares results to the action levels, and provides recommendations for use of the data.

4.1 DATA LIMITATIONS

The data from both the field GC and the laboratory may be subject to some limitations in its use. These limitations are described below.

4.1.1 Field GC Data Limitations

Results from the field GC were used for screening purposes as per the sampling plan. The GC data provide screening information for subsequent sampling and as an alert for potentially contaminated areas during the TSA waste retrieval operations. Also, the information gathered from GC screening may provide some additional insight for the future determination of breached waste containers within the TSA waste stack.

Data obtained from the field GC may be subject to several sources of error. Each sample collected was roughly measured to 500 mL. The sample weight, temperature, and air headspace volume were not precisely measured, but were held as constant as possible by inspection. Barometric pressure and exact air temperature were not recorded as each sample was taken. All of these factors can affect the results of GC screening to some degree and in combination, may diminish the data quality. The GC results show general trends and are sufficient for screening and identification of critical areas. This was the intent as per the sampling plan.

4.1.2 Laboratory Data Limitations

This section discusses any limitations of the radiological and chemical data which affect the data objectives.

4.2.1.1 Radiological Laboratory Data. Monitoring of radiological conditions combined with laboratory analysis for radionuclides thoroughly characterized the soils for radiological contamination. It is believed that the continuous monitoring of the air, drill cuttings, samples, and personnel, in addition to the soil laboratory analysis, provided comprehensive information for radionuclide contamination.

4.2.1.1 Chemical Laboratory Data. Nearly three-quarters (10 soil samples) of the samples collected for VOC analysis exceeded allowable holding times while at the offsite laboratory. Analytical data from samples exceeding the allowable holding times were declared invalid by the SMO.

4.2 DATA INTERPRETATION

This section describes the data interpretation methods which support conclusions for both the GC and laboratory analyses.

4.2.1 GC Data Interpretation

The GC data collected represents the concentrations of VOCs in the air headspace in each sample. This data does not measure concentrations of contaminants in the soil but rather shows the presence of VOCs in the soil gas in situ at the TSA site. Methods of interpretation and analysis of the GC data are as follows.

4.2.1.1 General Interpretation of GC Data. An interpretation of the field GC screening data is shown in Figures 5 and 6. The total VOCs detected with the GC were summed and assigned to each sampling point. Additionally, the points in space halfway between each adjacent sampling point were assumed to have a concentration of VOCs that is the average of the adjacent sampling points. Section 4.2.1.2 describes in detail how Figures 5 and 6 were developed. These figures show that the greatest potential for encountering VOCs in the soil gas is in the oldest part of the waste stack (TSA-1, Cell 1) and that this diminishes in the newer parts of the stack. The soil properties

TSA WASTE STACK - TOTAL VOCs DETECTED AT DEPTHS FROM 2 - 19 FT

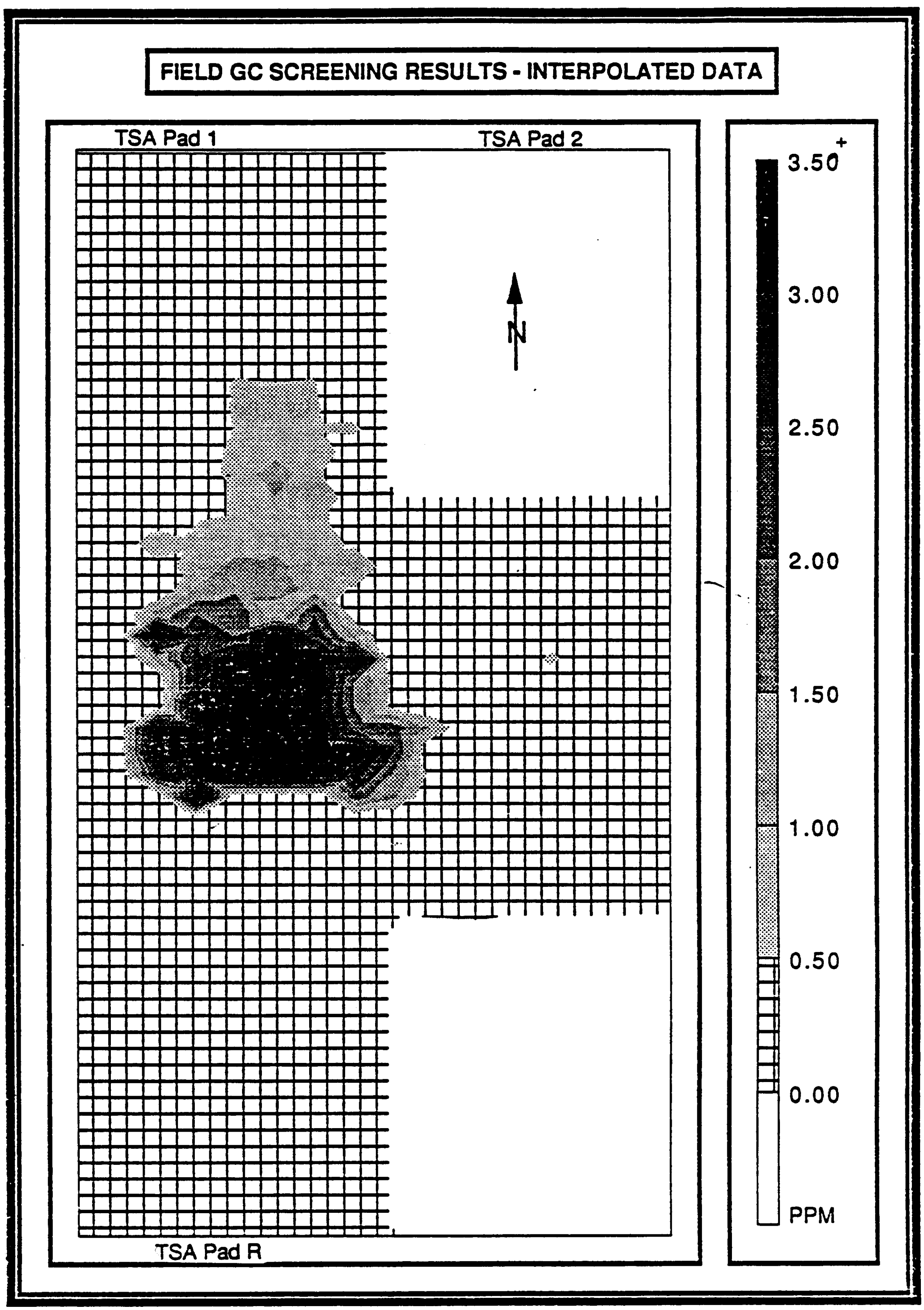


Figure 5. Interpreted results of the GC field screening method for the entire TSA waste stack.

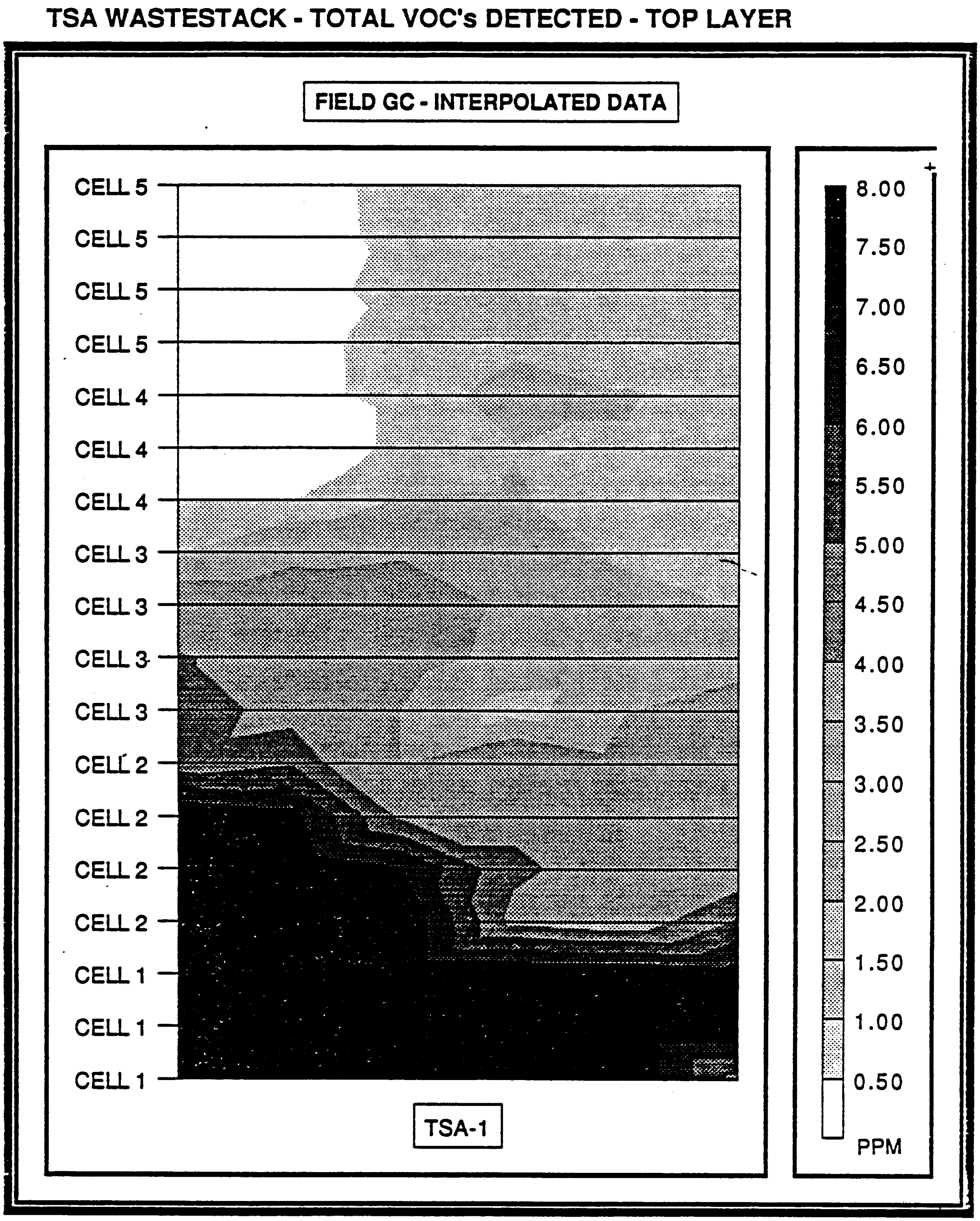


Figure 6. Interpreted results of the TSA-1 overburden soil headspace analysis for VOCs.

were relatively uniform so container degradation was most likely responsible for these differences.

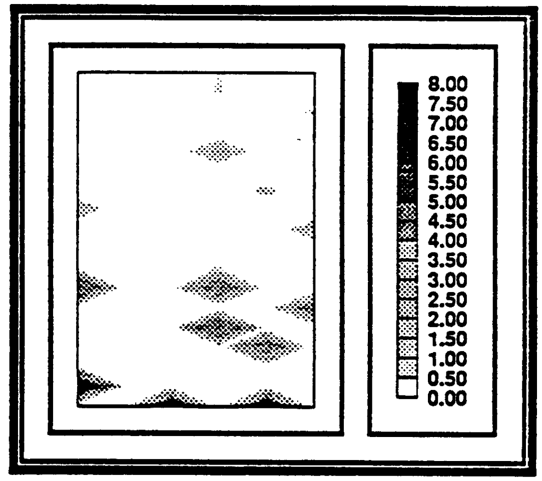
4.2.1.2 Graphical Representation of GC Data. Figure 7 was developed to support the following description of how the GC data were interpreted. Figure 7 shows the TSA-1 (Cells 1 through 5) area and the steps taken to arrive at the final interpretation of the GC data.

The VOCs detected in each GC sample were totaled, with a total of 0.50 ppm or greater considered as above background level for analysis. Totaled GC data were plotted on a 25 x 25-ft grid, sized to the physical dimensions of the TSA waste stack. Data from points not actually on grid coordinates were plotted at the nearest grid coordinate point. If more than one data point was plotted on a single grid coordinate point, then the highest data point value was used. Grid data were transferred to a spreadsheet program for processing. To enhance clarity in presentation of the data, the highest totals found were consolidated so that in each chart, higher values exist than are listed on the accompanying scale. In other words, values greater than 7.00 ppm are presented in black in Figures 5, 6, and 8.

Points that do not have actual test data assigned are assumed to have a potential for VOC contamination, which can be depicted by averaging the surrounding point values. Each data coordinate point (except for edge and corner points) is surrounded by eight other coordinate points. All open points were first examined to see if one or more of the contiguous points contained test data. The average value of all contiguous points was then assigned to the coordinate point under consideration. The total grid was then reexamined, starting with the coordinate point in the lower left-hand corner of the grid, evaluating each point in the lowest row of points before moving to the left end of the next higher row. Each open point considered was assigned the average value of all original and derived values contiguous to the point under consideration. Open points above and to the right of the considered points were ignored in the averaging process. The lower right-hand data point was arbitrarily given one-half the value of the point to the

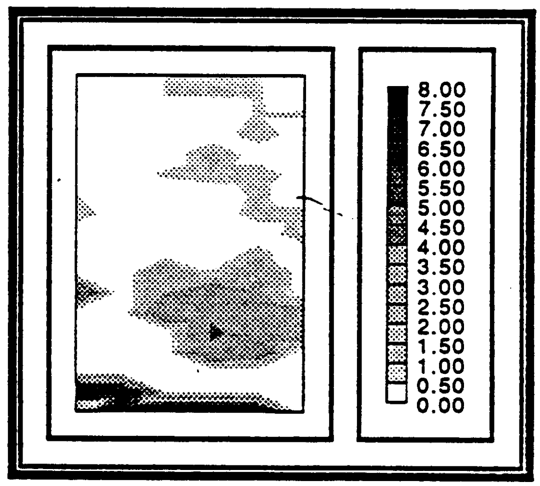
ORIGINAL DATA

	E50	E75	E100	E125	E150	E175
CELL 5				0.50		
CELL 5				0.56		
CELL 5						0.61
CELL 5						
CELL 4				1.29		
CELL 4		0.00				
CELL 4					0.67	
CELL 3	0.96					
CELL 3						0.97
CELL 3						
CELL 3				0.58		
CELL 2	4.37			3.35		
CELL 2						3.15
CELL 2				4.18		
CELL 2					3.25	
CELL 1						
CELL 1	12.58					
CELL 1			19.48		9.30	



FIRST INTERPOLATION

	E50	E75	E100	E125	E150	E175
CELL 5			0.53	0.50	0.53	
CELL 5			0.53	0.56	0.56	
CELL 5					0.59	0.61
CELL 5					0.95	
CELL 4				1.29		
CELL 4		0.00	0.65	0.98	0.98	
CELL 4	0.48	0.48			0.67	
CELL 3	0.96				0.82	0.82
CELL 3						0.97
CELL 3					0.78	
CELL 3			1.97	0.58	1.97	
CELL 2	4.37		1.97	3.35	2.36	
CELL 2			3.77	3.77	3.56	3.15
CELL 2				4.18	3.53	3.20
CELL 2				3.72	3.25	
CELL 1						
CELL 1	12.58	16.03				
CELL 1		16.03	19.48	14.39	9.30	



SECOND INTERPOLATION

	E50	E75	E100	E125	E150	E175
CELL 5	0.39	0.44	0.53	0.50	0.53	0.55
CELL 5	0.34	0.44	0.53	0.56	0.56	0.57
CELL 5	0.27	0.40	0.55	0.65	0.59	0.61
CELL 5	0.22	0.33	0.63	0.85	0.95	0.82
CELL 4	0.16	0.28	0.64	1.29	1.00	0.94
CELL 4	0.32	0.00	0.65	0.98	0.98	0.82
CELL 4	0.48	0.48	1.01	1.05	0.67	0.82
CELL 3	0.96	1.70	1.84	1.45	0.82	0.82
CELL 3	2.89	2.80	2.59	1.63	1.14	0.97
CELL 3	4.13	3.59	2.43	1.54	0.78	1.42
CELL 3	4.66	3.59	1.97	0.58	1.97	1.96
CELL 2	4.37	4.96	1.97	3.35	2.36	2.76
CELL 2	10.06	7.61	3.77	3.77	3.56	3.15
CELL 2	14.40	11.41	7.31	4.18	3.53	3.20
CELL 2	14.58	14.23	10.10	3.72	3.25	5.25
CELL 1	14.31	14.85	13.20	10.40	8.56	7.72
CELL 1	12.58	16.03	16.48	14.91	10.81	8.25
CELL 1	14.88	16.03	19.48	14.39	9.30	4.65

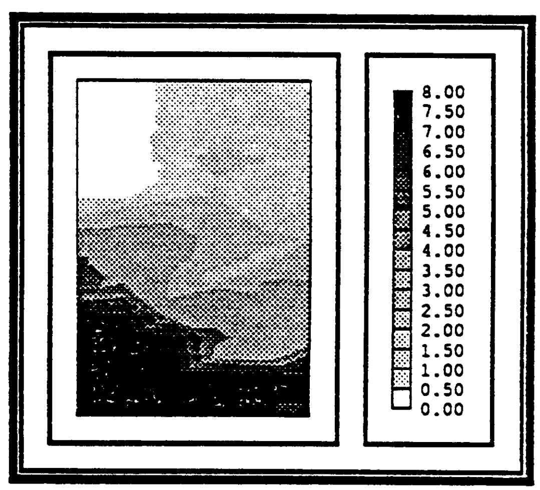


Figure 7. Step-by-step method for interpretation of the field GC screening data for VOCs in the TSA-1 Cells 1-5 overburden soil headspace.

immediate left if no other contiguous points contained an original or a derived value.

Two topographical maps (Figures 5 and 6) representing gradient potentials of the point data were generated using the contour mapping capabilities of the spreadsheet and the above procedure. Figure 5 contains data from all data sampling depths and all data points, while Figure 6 contains data only from the upper overburden above Cells 1 through 5 of the TSA-1 Pad.

4.2.1.3 Graphical Representation of GC Data for the Caisson Area. Figure 8 shows the depths of the test holes and concentrations detected by GC headspace analysis for each of the boreholes in the support caisson area. This figure shows the area(s) where monitoring conditions during construction will be most critical.

4.2.2 Laboratory Data and Action Levels

The laboratory data for PCBs, metals, and radionuclides did not show any contamination exceeding action levels in the soils. Only one data point exceeded action levels for VOCs and this value was estimated. Action levels are established in the *Soil Sampling Plan for the Transuranic Storage Area Soil Overburden* and are shown in Table 3.[a]

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a. Hardy, C. K., Pickett, S. L., and Stanisich, S. N., *Soil Sampling Plan for the Transuranic Storage Area Soil Overburden*, EG&G-WM-8986, Idaho National Engineering Laboratory, Idaho Falls, Idaho, 1990.

Table 3. Action levels for contaminants detected in the soils

Metals:	95% upper one-tailed tolerance limit.
VOCs:	3 x method detection limit
PCBs:	3 x method detection limit
Radionuclides:	greater than D&D release criteria[a]

4.3 Comparison of GC to Laboratory Data for VOCs

The laboratory tests of the TSA overburden soil measured the concentrations of VOCs that were adhered to the soil particles by sorption or dissolved in the pore water. The laboratory detection limits for VOCs in soils were greater than the concentrations of any VOCs present in the TSA overburden soil. The field GC detected soil vapor concentrations in samples that were warmed to room temperature in a sealed bag. The field GC data cannot be directly compared to the laboratory data since the variables discussed in Section 4.1 were not carefully controlled.

a. "Radiological Release Criteria for Soils", Development of Criteria for Release of Idaho National Engineering Laboratory Sites Following Decontamination and Decommissioning, EG&G Idaho, 1986.

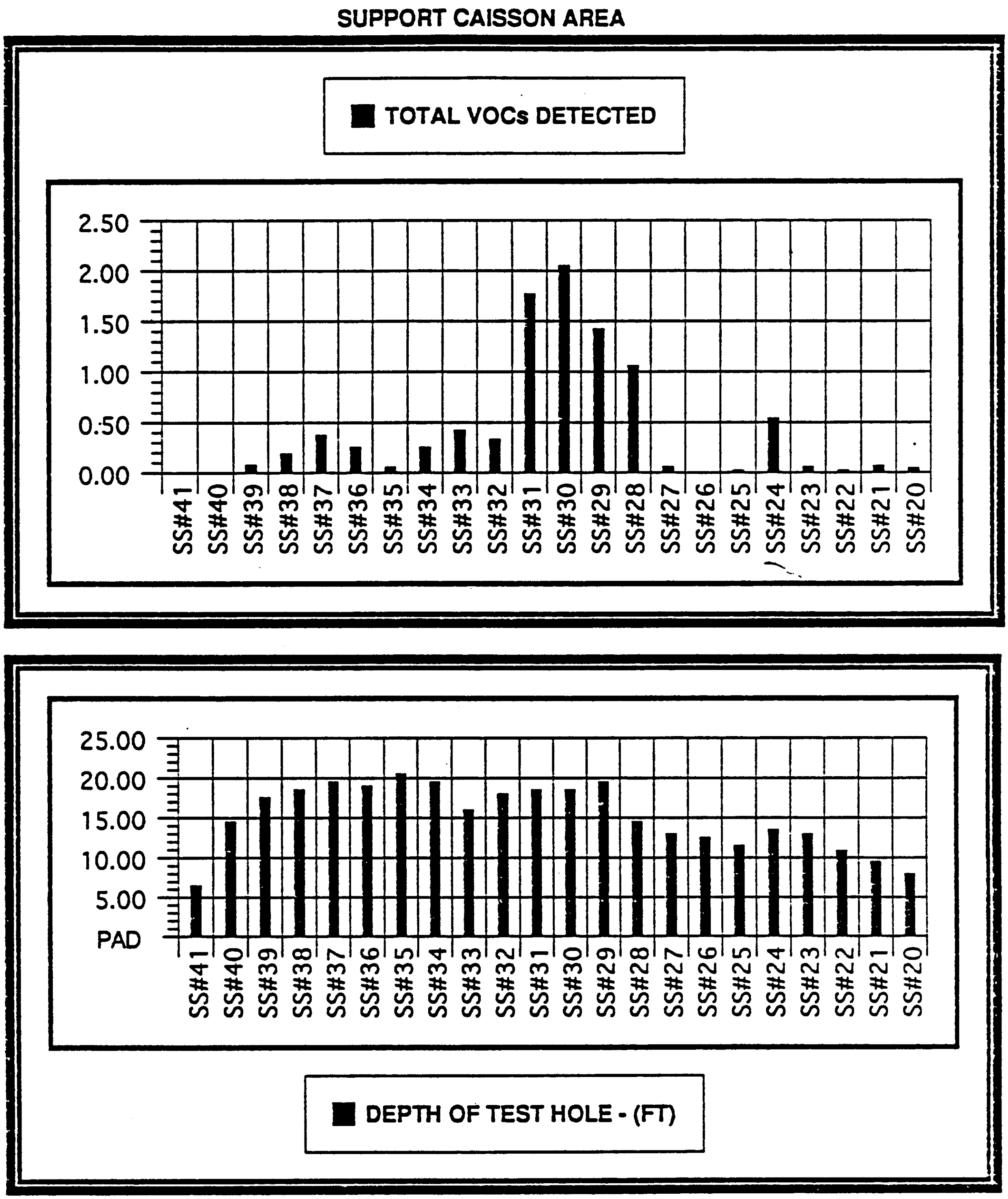

Figure 8. Results of soil headspace analysis for VOCs in the support caisson area.

4.4 Conclusions and Recommendations

The overburden and sideburden soils characterized by this investigation are uncontaminated (below action limits) for the contaminants sought. This is based on the results of the GC field screening, measurements made by instruments in the field, and laboratory analysis for both radionuclides and chemical constituents.

The intent of the field characterization is to determine whether the overburden soil has become contaminated, identify the type (radiological and/or chemical) and extent of the contamination. Although the results of the field characterization conclude that contaminant concentrations are below action levels, continuous monitoring of the conditions during construction activities is recommended. Conditions are subject to change due to weather influences or degradation of materials within the waste stack. Particular care should be taken in the TSA-1 Cell 1 area, based on the potential presence of VOCs in the soil gas (see Figure 5).

Transient organic vapors may be present during periods of low atmospheric pressure, as they may be drawn through the soil from the source to the atmosphere. Monitoring for these vapors (particularly carbon tetrachloride) is recommended during all construction activities. It is believed that vapors detected in the soil sample headspace with the field GC originated from the TSA waste stack.

Radiological contamination is not expected during excavation, but soils should be surveyed during critical operations. Soils removed from the lower part of the stack will have the greatest potential for the presence of radionuclides.

In conclusion, construction activities should proceed with caution and arrangements should be made to provide continuous monitoring of conditions during the excavation.

APPENDIX A

RWMC Health Physics Report for the TSA Soil Sampling Task

EG&G Idaho

"Providing research and development services to the government"

INTEROFFICE CORRESPONDENCE

Date: August 28, 1991

To: [redacted]

From: M. K. Branter, MS 4202 MKBranter

Subject: RADIOLOGICAL SURVEY RESULTS OF TSA OVERBURDEN DRILLING AND SAMPLING - MKB-74-91

The following is a brief description of radiological surveys performed during the sampling and drilling of the TSA overburden.

Radiation surveys were performed in drilling areas, prior to work and intermittently during work operations. Radiation levels were <0.1 mr/hr on the majority of the TSA pads with the exception of areas adjacent to TSAR and ASB-II. The highest whole body radiation field next to TSAR was 3 mr/hr. The highest whole body field next to ASB-II was 0.5 mr/hr. Radiation surveys were also taken in sample holes where it was suspected a box had been hit. Results of these surveys were all <0.1 mr/hr.

During drilling operations of the TSA overburden, power auger bits, hand auger heads, and soil spin-off's were direct monitored using a Ludlum 2A for β-γ contamination and a Ludlum 61 or Eberline ASP-1 for α contamination. Throughout drilling and sampling, direct monitoring results remained <100 cpm β-γ and no detectable α. In areas where background levels were too high to direct monitor, extra smears were taken to compensate.

Smear surveys were taken on auger bits and hand auger heads after drilling each bore hole. Also, at the completion of work each day, smears were taken on drilling equipment and on all tools used. The smears were counted on an α, β-γ smear counter with results of all smears <20 dpm/smear α and <200 dpm/smear β-γ.

Several times during drilling operations, foreign objects were detected in the soil spin-off. The objects consisted of wood chips, yellow herculite, white styrofoam, and construction rope. When these items were encountered, work was stopped. The material was scanned for alpha and beta-gamma contamination and then placed in an α, β-γ smear counter. No radioactivity was detected on any of this material.

High volume air samples were taken continuously during drilling operations. Air samples were taken in the breathing zone downstream of workers and drilling operations. Upon completion of work, air filters were pulled and counted to determine the β-γ to α ratios. All ratios were consistent with the natural activity usually found at the INEL. After at least one week decay, air filters were counted on a Tennelec LB5100 smear counter. The results of all air filters were <10% dac for α and β-γ radioactivity. See Attachment for individual air sample results.

Water samples were taken of decontamination rinse for auger heads. Decontamination was not performed for radiological purposes. Results of all water samples taken were less than the EG&G water release limits of 3×10^{-7} μC/mi β-γ and 3×10^{-8} μCi/mi for α contamination.

ERS:bmr

Attachment:
As Stated

cc: w/Attachment
E. R. Spruill, Jr., MS 8107
M. K. Branter File
Central File, MS 1651

General Formula
$(dpm/ft^3) \times (1.59 \times 10^{-11}) = \mu Ci/cc$

DAC $\beta\gamma = 2 \times 10^{-9}$ [unidentified, no alpha]
$\alpha = 2 \times 10^{-11}$ [unknown alpha, but no TRU]
$\alpha = 2 \times 10^{-12}$ [unknown alpha]

Counter/Scaler type: Tennelec LB 5100 Serial No. 262227
CAM Manufacturer: HI Q Model No. MRU 12C Serial No. 2093

Date & Time	CAM Location	CAM Flow Rate (cfm)	Filter Run Time (min)	Total Volume (ft3)	Absorption Factor	Count Time (min)	Gross Counts (CPM)	Background (cpm)	Net cpm	Counter/Scaler Efficiency	dpm	µCi/cc	Type of Activity	Decay Time (min)	% DAC	HP Name	Remarks
2-27-91 0800	TSA DRILL	6	252	1512	1.0	10.0	3.7	3.3	0.4	20%	2.0	$2.10e^{-14}$	Bγ	10,080	1.0^{-3}	3-6-91	
2-27-91 1400	"	"	"	"	0.7	10.0	0.2	0.1	0.1	31%	0.46	$4.84e^{-15}$	α	"	2.4^{-1}	ER Aprill	6.0:1 βγ Tc
2-28-91 0800	TSA DRILL	6	210	1260	1.0	10.0	4.3	3.3	1.0	20%	5.0	$6.31e^{-14}$	Bγ	8640	3.2^{-3}	3-6-91	
2-28-91 1400	"	"	"	"	0.7	"	0.1	0.1	∅	31%	∅	<MDA	α	"	<10% DAC	ER Aprill	4.1:1 βγ Tc
3-7-91 0800	TSA DRILL	6	180	1080	1.0	10.0	3.8	3.6	0.2	21%	0.95	$1.40e^{-14}$	Bγ	15840	7.0^{-4}	3-18-91	
3-7-91 1600 ~~0800~~	"	"	"	"	0.7	"	∅	0.2	-0.2	31%	-0.95	$-1.40e^{-14}$	α	"	7.0^{-1}	ER Aprill	4.0:1 βγ
3-12-91 0900	TSA DRILL	6	120	720	1.0	10.0	4.6	3.6	1.0	21%	4.76	$1.05e^{-13}$	Bγ	8640	5.3^{-3}	3-18-91	
3-12-91 1200	"	"	"	"	0.7	10.0	0.1	0.2	-0.1	31%	-0.46	$-1.01e^{-14}$	α	"	-5.1^{-1}	ER Aprill	3.6:1 βγ T
3-12-91 1300	TSA DRILL	6	135	792	1.0	10.0	3.8	3.6	0.2	21%	0.95	$1.91e^{-14}$	Bγ	8640	9.5^{-4}	3-18-91	
3-12-91 1600	"	"	"	"	0.7	"	0.1	0.2	-0.1	31%	-0.46	$-1.01e^{-14}$	α	"	-5.1^{-1}	ER Aprill	3.8:1 βγ T
3-13-91 0800	TSA DRILL	6	168	1008	1.0	10.0	2.9	3.6	-0.7	21%	-3.33	$-5.25e^{-14}$	Bγ	7200	-2.6^{-3}	3-18-91	
3-13-91 1200	"	"	"	"	0.7	"	0.1	0.2	-0.1	31%	-0.46	$-1.01e^{-14}$	α	"	-5.1^{-1}	ER Aprill	3.5:1 βγ T

Supervisor Review
[illegible] Butler 5-21-91

Air Sample Data Sheet

General Formula
$(\text{dpm}/\text{ft}^3) \times (1.59 \times 10^{-11}) = \mu\text{Ci/cc}$

AC $\beta\gamma$ = 2×10^{-9} [unidentified, no alpha]
α = 2×10^{-11} [unknown alpha, but no TRU]
α = 2×10^{-12} [unknown alpha]

Counter/Scaler type: Tennelec LB 5100 Serial No. ______
CAM Manufacturer: HI Q Model No. MRV 12C Serial No. 2093

Date & Time	CAM Location	CAM Flow Rate	Filter Run Time (min)	Total Volume (ft³)	Absorption Factor	Count Time (min)	Gross Counts (CPM)	Background (cpm)	Net cpm	Counter/Scaler Efficiency	dpm	µCi/cc	Type of Activity	Decay Time (min)	% DAC	HP Name	Remarks
3-13-91 1300	TSA DRILL	6	138	828	1.0	10.0	3.8	3.6	0.2	21%	0.95	$1.83e^{-14}$	$\beta\gamma$	7200	9.1^{-4}	3 18 91	
3-13-91 1620	"	"	"	"	0.7	"	0.6	0.2	0.4	31%	1.29	$2.48e^{-14}$	α	"	1.2%	CR Lpruill	3.7:1 Bγ To
3-14-91 0900	TSA DRILL	6	120	720	1.0	10.0	4.9	3.6	1.3	21%	6.19	$1.37e^{-13}$	$\beta\gamma$	5760	6.8^{-3}	3-18-91 CR	
3-14-91 1530	"	"	"	"	0.7	"	0.6	0.2	0.4	31%	1.29	$2.84e^{-14}$	α	5760	1.47%	Lpruill	3.0:1 Bγ To
3-18-91 0900	TSA DRILL	6	378	2268	1.0	10.0	4.3	3.4	0.9	21%	4.29	$3.00e^{-14}$	$\beta\gamma$	22 DAYS	1.5^{-3}	4-11-91 CR	
3-18-91 1600	"	"	"	"	0.7	"	0.3	0.1	0.2	30%	0.95	$6.68e^{-15}$	α	"	3.3^{-1}	Lpruill	4.2:1 Bγ To
3-19-91 0800	TSA DRILL	6	180	1080	1.0	10.0	4.6	3.4	1.2	21%	5.71	$8.41e^{-14}$	$\beta\gamma$	21 DAYS	4.2^{-3}	4-11-91 CR	
3-19-91 1630	"	"	"	"	0.7	"	0.1	0.1	0	30%	0	<MDA	α	"	<10% DAC	Lpruill	4.6:1 Bγ To
3-20-91 09000	TSA DRILL	6	330	1980	1.0	10.0	5.8	3.4	2.4	21%	11.43	$9.18e^{-14}$	$\beta\gamma$	20 DAYS	4.6^{-3}	4-11-91 CR	
3-20-91 1630	"	"	"	"	0.7	"	0.2	0.1	0.1	30%	0.48	$3.82e^{-15}$	α	"	1.9^{-1}	Lpruill	3.8:1 Bγ To
3-21-91 0820	TSA DRILL	6	438	2628	1.0	10.0	5.3	3.4	1.9	21%	9.05	$5.47e^{-14}$	$\beta\gamma$	20 DAYS	2.7^{-3}	4-11-91 CR	
3-21-91 1540	"	"	"	"	0.7	"	0.5	0.1	0.4	30%	1.90	$1.15e^{-14}$	α	"	5.7^{-1}	Lpruill	4.1:1 Bγ To

5.E. [signature] 5-2-91

[illegible]

General Formula
$(dpm/ft^3) \times (1.59 \times 10^{-11}) = \mu Ci/cc$

IC Bγ = 2×10^{-9} [unidentified, no alpha]
α = 2×10^{-11} [unknown alpha, but no TRU]
α = 2×10^{-12} [unknown alpha]

Counter/Scaler type: Tennelec LB 5100 Serial No. 262227
CAM Manufacturer: HI Q Model No. MRU 12C Serial No. 2093

Date & Time	CAM Location	CAM Flow Rate	Filter Run Time (min)	Total Volume (ft^3)	Absorption Factor	Count Time (min)	Gross Counts (CPM)	Background (cpm)	Net cpm	Counter/Scaler Efficiency	dpm	μCi/cc	Type of Activity	Decay Time (min)	% DAC	HP Name	Remarks
3-28-91 0900	TSA DRILL	6	145	864	1.0	10.0	4.5	3.4	1.1	21%	5.24	$9.64e^{-14}$	Bγ	13 DAYS	4.8^{-3}	4-11-91	
3-28-91 1300	"	"	"	"	0.7	"	0.2	0.1	0.1	30%	0.48	$8.76e^{-15}$	α	"	4.4^{-1}	[illegible]	3.0:1 Bγ
4-1-91 0800	TSA DRILL	6	180	1080	1.0	10.0	5.1	4.6	0.5	21%	2.38	$3.51e^{-14}$	Bγ	14 DAYS	1.8^{-3}	4-16-91	
4-1-91 1600	"	"	"	"	0.7	"	0.4	0.1	0.3	30%	1.43	$2.10e^{-14}$	α	"	1.0%	[illegible]	3.5:1 Bγ [illegible]
4-2-91 0800	TSA DRILL	6	216	1296	1.0	10.0	5.8	4.6	1.2	21%	5.71	$7.01e^{-14}$	Bγ	13 DAYS	3.5^{-3}	4-16-91	
4-2-91 1500	"	"	"	"	0.7	"	0.5	0.1	0.4	30%	1.90	$2.34e^{-14}$	α	"	1.27%	[illegible]	4.1:1 Bγ [illegible]
4-3-91 0800	TSA DRILL	6	144	864	1.0	10.0	4.1	4.6	-0.5	21%	-2.38	$-4.38e^{-14}$	Bγ	12 DAYS	2.2^{-3}	4-16-91	
4-3-91 1300	"	"	"	"	0.7	"	∅	0.1	-0.1	30%	-0.47	$-8.76e^{-15}$	α	"	4.4^{-1}	[illegible]	4.1:1 Bγ [illegible]
4-4-91 0800	TSA DRILL	6	156	936	1.0	10.0	4.6	4.6	∅	21%	∅	<MDA	Bγ	11 DAYS	<10% DAC	4-16-91	
4-4-91 1200	"	"	"	"	0.7	"	∅	0.1	-0.1	30%	-0.47	$-8.09e^{-15}$	α	"	4.0^{-1}	[illegible]	4.6:1 Bγ [illegible]
4-8-91 0830	TSA DRILL	6	180	1080	1.0	10.0	4.0	4.6	-0.6	21%	-2.86	$4.21e^{-14}$	Bγ	8 DAYS	2.1%	4-16-91	
4-8-91 1030	"	"	"	"	0.7	"	0.1	0.1	∅	30%	∅	<MDA	α	"	<10% DAC	[illegible]	4.2:1 Bγ [illegible]

A-6

S.R. [illegible] 5-21-91

General Formula
$(\text{dpm}/\text{ft}^3) \times (1.59 \times 10^{-11}) = \mu\text{Ci/cc}$

IC Bγ $= 2 \times 10^{-9}$ [unidentified, no alpha]
α $= 2 \times 10^{-11}$ [unknown alpha, but no TRU]
α $= 2 \times 10^{-12}$ [unknown alpha]

Counter/Scaler type: Tennelec LB 5100 Serial No. 262227
CAM Manufacturer: AI Q Model No. MRV 12C Serial No. 2493

Date & Time	CAM Location	CAM Flow Rate	Filter Run Time (min)	Total Volume (ft3)	Absorption Factor	Count Time (min)	Gross Counts (CPM)	Background (cpm)	Net cpm	Counter/Scaler Efficiency	dpm	µCi/cc	Type of Activity	Decay Time (min)	% DAC	HP Name	Remarks
4-9-91 0800	TSA DRILL	6	72	432	1.0	10.0	3.9	4.3	-0.4	21%	-1.9	$7.01e^{-14}$	Bγ	14 DAYS	3.5^{-3}	4-23-91	
4-9-91 1100	"	"	"	"	0.7	"	0.7	0.2	0.5	30%	2.38	$8.76e^{-14}$	α	"	4.3%	IR Lpuell	4.2:1 Bγ Tc
4-10-91 0830	TSA DRILL	6	114	684	1.0	10.0	4.9	4.3	0.6	21%	2.86	$6.64e^{-14}$	Bγ	13 DAYS	3.3^{-3}	4-23-91 IR	
4-10-91 1200	"	"	"	"	0.7	"	0.2	0.2	Ø	30%	Ø	<MDA	α	"	<10% DAC	Lpuell	4.0:1 Bγ T.
4-10-91 1300	TSA DRILL	6	60	360	1.0	10.0	4.2	4.3	-0.1	21%	-0.48	$2.10e^{-14}$	Bγ	13 DAYS	1.1^{-3}	4-23-91	
4-10-91 1630	"	"	"	"	0.7	"	0.4	0.2	0.2	30%	0.95	$4.21e^{-14}$	α	"	2.1%	IR Lpuell	5.0:1 Bγ Tc
4-11-91 1400	TSA DRILL	6	84	504	1.0	10.0	6.0	4.3	1.7	21%	8.10	$2.55e^{-13}$	Bγ	12 DAYS	1.3^{-2}	4-23-91	
4-11-91 1600	"	"	"	"	0.7	"	0.4	0.2	0.2	30%	0.95	$3.00e^{-14}$	α	"	1.5%	IR Lpuell	3.6:1 Bγ T.
4-17-91 1000	TSA DRILL	6	120	720	1.0	10.0	4.7	4.3	0.4	21%	1.90	$4.21e^{-14}$	Bγ	6 DAYS	2.1^{-3}	4-23-91	
4-17-91 1600	"	"	"	"	0.7	"	0.1	0.2	-0.1	30%	-0.48	$1.05e^{-14}$	α	"	5.3^{-1}	IR Lpuell	3.6:1 Bγ Tc
4-22-91 0800	TSA DRILL	6	216	1296	1.0	10.0	4.0	3.8	0.2	21%	0.95	$1.17e^{-14}$	Bγ		5.8^{-4}	4-23-91	
4-22-91 1500	"	"	"	"	0.7	"	0.3	0.1	0.2	30%	0.95	$1.17e^{-14}$	α		5.8^{-1}	"	5.0:1 Bγ Tox

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General Formula
$(dpm/ft^3) \times (1.59 \times 10^{-11}) = \mu Ci/cc$

\C $B\gamma = 2 \times 10^{-9}$ [unidentified, no alpha]
$\alpha = 2 \times 10^{-11}$ [unknown alpha, but no TRU)
$\alpha = 2 \times 10^{-12}$ [unknown alpha]

Counter/Scaler type: Tennelec LB 5100 Serial No. T. 262227
CAM Manufacturer: HI Q Model No. MRV 12C Serial No. 2093

Date & Time	CAM Location	CAM Flow Rate	Filter Run Time (min)	Total Volume (ft3)	Absorption Factor	Count Time (min)	Gross Counts (CPM)	Background (cpm)	Net cpm	Counter/Scaler Efficiency	dpm	µCi/cc	Type of Activity	Decay Time (min)	% DAC	HP Name	Remarks
4-23-91 0900	TSA DRILL	6	108	648	1.0	10.0	4.3	3.8	0.5	21%	2.38	5.84_e^{-14}	Bγ		2.9^{-3}	ER Spruill	
4-23-91 1500	"	"	"	"	0.7	"	0.1	0.1	Ø	30%	Ø	<MDA	α		<10% DAC		3.7:1 Rδ:
													Bγ				
													α				
													Bγ				
													α				
													Bγ				
													α				
													Bγ				
													α				
													Bγ				
													α				

[signature] 5-2-91

A-8

APPENDIX B

RWMC INDUSTRIAL HYGIENE DATA AND CALCULATIONS

EG&G ENVIRONMENTAL HYGIENE LABORATORY ANALYTICAL REPORT

Date: May 21, 1991

Report No. 91-0362

Requestor: D. S. Shoop

Address: ROB-I/MS 4202

The samples received by the laboratory on March 19, 1991 were collected on Sorbent Capsules Badges manufactured by SKC. These samples were analyzed on May 14, 1991 for the presence of methylene chloride and carbon tetrachloride. Analysis was performed by gas chromatography/flame ionization detector (GC/FID) equipped with a 20 foot by 1/8 inch inside diameter packed column. The packing was GP-10% SP-1000 on 80/100 Supelcoport.

The samples were extracted with 1.5 mL OMNISOLVE Carbon Disulfide. The results for sample 225103 are reported in micrograms only. Insufficient information provided by SKC prevented futher calculations. The desorption efficiency for carbon tetrachloride was determined to be 93.5%. Also, on sample 225103 other organic compounds were detected. These compounds were benzene, trichloroethene, chloroform, and perchloroethene, all were at lower levels than carbon tetrachloride. Concentrations were determined using SOP-EM-EH-4.01.

ANALYTICAL RESULTS

SAMPLE ID	LAB ID	DCM ppm	CTC ppm
225101	91-1641	N.D.	N.D.
225102	91-1642	N.D.	N.D.
225104	91-1643	N.D.	N.D.
225103	91-1647	N.D.	457.8*

* Micrograms

N.D.: Not Detected- less than minimum quantifiable amount

Minimum quantifiable amount: Methylene Chloride (DCM) 7.3 microgams/sample
Carbon Tetrachloride (CTC) 16.8 micrograms/sample

AIHA Accredited

Analyst: David Bush

Laboratory Director: T. J. [illegible]

From: OOP --INELVM1 Date and time 08/21/91 12:01:43
To: RGS --INELVM1

FROM: DOUG S SHOOP - Industrial Hygienist
Waste Management - RWMC
MS 4202 Phone 526-6653 Profs ID: OOP

Subject: TSA VOC CONCENTRATIONS

Calculated concentration of carbon tetrachloride is 5.93 ppm. The associated calculations are in the mail. Hope the info. is helpful. Talk to you later.
Doug

Ray, please find below the calculated concentration of carbon tetrachloride reported in parts per million as per your request.

Carbon Tetrachloride reported concentration	= 457.8 ug or 0.4578 mg
Carbon Tetrachloride molecular weight	= 153.81 or 154
Gas volume at standard temperature & pressure	= 24.45
Diffussion rate for Carbon Tetrachloride	= 9.39 ml/min.
Sampling time	= 1305 min.
Volume sampled = 9.39 ml/min. x 1305 min.	= 12253.95 ml
12253.95 cm^3 x 1 m^3 /10^6 cm^3	= 1.225395×10^{-2} m^3

$$\text{ppm} = \frac{(0.4578)}{(1.225395 \times 10^{-2})} \times \frac{(24.45)}{(154)} = 5.93 \text{ ppm } CCl_4$$

It is important to note that the expressed concentration is <u>only an approximation.</u> The diffussion rate for carbon tetrachloride is based on sampling in ambient air not inside a moist hole in the ground and is therefore likely to be some what inaccurate. The conversion for standard temperature and pressure would also be some what inaccurate since the sample was taken in the hole. Without additional product and environmental (i.e. down hole temperature and barometeric pressure) data, it is unclear wether these variables would significantly bias the data to the high side or low side. If I can help you any further please let me know. Doug.

APPENDIX C

Results of the Field GC Screening Method

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
1	Feb 26,91	11:41	C	BENZENE	9.80 PPM	59	1864417	BTEX
1			C	TOLUENE	9.80 PPM	87	2957165	
1			C	E-BENZ	9.30 PPM	166	1235858	
2	Feb 26,91	11:55	A	BENZENE	14.38 PPM	58	2738651	TSA1752GC
2			A	UNKNOWN	203.21 PPM	91	36620031	
2			A	UNKNOWN	184.05 PPM	131	35014784	
2			A	E-BENZ	12.53 PPM	166	2338697	
2			A	UNKNOWN	1.71 PPM	198	325014	
2			A	UNKNOWN	0.59 PPM	263	111512	
3	Feb 27,91	08:32	C	BENZENE	9.80 PPM	51	1262742	BTEX
3			C	TOLUENE	9.80 PPM	63	1021920	
3			C	E-BENZ	9.30 PPM	94	1331322	
4	Feb 27,91	08:39	C	BENZENE	9.80 PPM	60	1435571	BTEX
4			C	TOLUENE	9.80 PPM	89	1860294	
4			C	E-BENZ	9.30 PPM	172	1008843	
5	Feb 27,91	08:48	C	BENZENE	9.80 PPM	60	1631280	BTEX
5			C	TOLUENE	9.80 PPM	88	2168782	
5			C	E-BENZ	9.30 PPM	169	1283212	
6	Feb 27,91	09:05	A	BENZENE	0.04 PPM	55	5843	ROOM BLANK
6			A	TOLUENE	0.06 PPM	87	14245	
7	Feb 27,91	10:21	A		0.00 PPB	30	0	TSA0101GC

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
8	Feb 27,91	10:40	A		0.00 PPB	30	0	TSA0101GC
9	Feb 27,91	13:57	A		0.00 PPB	30	0	TSA1753GC
10	Feb 28,91	08:39	C	BENZENE	9.80 PPM	51	272853	BTEX
10			C	TOLUENE	9.80 PPM	82	2451517	
10			C	E-BENZ	9.30 PPM	92	3294293	
11	Feb 28,91	09:18	C	BENZENE	9.80 PPM	56	4332366	BTEX
11			C	TOLUENE	9.80 PPM	88	6278082	
11			C	E-BENZ	9.30 PPM	168	3244831	
12	Feb 28,91	09:35	C	BENZENE	9.80 PPM	60	4709543	BTEX
12			C	TOLUENE	9.80 PPM	88	6996867	
12			C	E-BENZ	9.30 PPM	167	4651510	
13	Feb 28,91	09:51	C	BENZENE	9.80 PPM	60	4900528	BTEX
13			C	TOLUENE	9.80 PPM	88	7811486	
13			C	E-BENZ	9.30 PPM	169	5089542	
14	Feb 28,91	10:06	A	BENZENE	0.13 PPM	60	96966	ROOM BLANK
14			A	TOLUENE	0.09 PPM	88	71930	
15	Feb 28,91	10:43	A	BENZENE	0.01 PPM	60	5829	TSA0102GC
15			A	TOLUENE	0.02 PPM	88	18969	
16	Feb 28,91	11:01	A	TOLUENE	0.01 PPM	88	9804	TSA0102GC
17	Feb 28,91	13:20	C	BENZENE	9.80 PPM	63	5172726	BTEX
17			C	TOLUENE	9.80 PPM	92	9251247	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
17			C	E-BENZ	9.30 PPM	171	5420652	
18	Feb 28,91	13:26	C	BENZENE	9.80 PPM	59	5357581	BTEX
18			C	TOLUENE	9.80 PPM	87	10799798	
18			C	E-BENZ	9.30 PPM	166	5976020	
19	Feb 28,91	13:31	C	BENZENE	9.80 PPM	59	9948611	BTEX
19			C	TOLUENE	9.80 PPM	87	14264633	
19			C	E-BENZ	9.30 PPM	165	9556105	
20	Feb 28,91	13:48	C	BENZENE	9.80 PPM	59	7583927	BTEX
20			C	TOLUENE	9.80 PPM	87	15384654	
20			C	E-BENZ	9.30 PPM	166	6422297	
21	Feb 26,91	14:05	A	BENZENE	0.10 PPM	59	79240	TSA0103GC
21			A	TOLUENE	0.07 PPM	87	117466	
21			A	E-BENZ	0.02 PPM	164	11973	
22	Feb 28,91	14:19	A	TOLUENE	0.05 PPM	87	79580	TSA0103GC
23	Feb 28,91	14:33	A	TOLUENE	0.01 PPM	86	10811	ROOM BLANK
24	Mar 07,91	08:46	C	BENZENE	9.80 PPM	45	1220292	BTEX
24			C	TOLUENE	9.80 PPM	55	1274835	
24			C	E-BENZ	9.30 PPM	82	1688284	
25	Mar 07,91	08:52	C	BENZENE	9.80 PPM	60	1619522	BTEX
25			C	TOLUENE	9.80 PPM	88	2289950	
25			C	E-BENZ	9.30 PPM	139	1480040	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
26	Mar 07,91	09:19	C	BENZENE	9.80	PPM	59	1960740	BTEX
26			C	TOLUENE	9.80	PPM	87	2215572	
26			C	E-BENZ	9.30	PPM	167	1738203	
27	Mar 07,91	09:35	C	BENZENE	9.80	PPM	59	1985343	BTEX
27			C	TOLUENE	9.80	PPM	87	2257168	
27			C	E-BENZ	9.30	PPM	168	1697552	
28	Mar 07,91	09:50	A	BENZENE	0.08	PPM	59	15277	ROOM BLANK
28			A	TOLUENE	0.03	PPM	86	8061	
29	Mar 07,91	10:02	A	UNKNOWN	1.30	PPM	45	262971	C-TET
29			A	UNKNOWN	7.49	PPM	68	1516459	
29			A	UNKNOWN	20.89	PPM	80	4231303	
30	Mar 07,91	10:15	A	UNKNOWN	0.07	PPM	68	13718	ROOM BLANK
30			A	UNKNOWN	0.26	PPM	81	53081	
31	Mar 07,91	10:21	A	UNKNOWN	0.01	PPM	68	2871	TSA0104GC
31			A	UNKNOWN	0.12	PPM	80	34531	
32	Mar 07,91	10:39	A	UNKNOWN	0.03	PPM	70	6238	TSA0104GC
32			A	UNKNOWN	0.21	PPM	83	43176	
33	Mar 07,91	10:43	A	UNKNOWN	0.02	PPM	69	3811	TSA0105GC
33			A	UNKNOWN	0.10	PPM	28	19870	
34	Mar 07,91	10:58	A		0.00	PPB	30	0	ROOM BLANK
35	Mar 07,91	11:04	A		0.00	PPB	30	0	TSA0105GC

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
36	Mar 07,91	11:07	A		0.00	PPB	30	0	TSA0104GC
37	Mar 07,91	11:23	C	BENZENE	9.80	PPM	60	2405445	BTEX
37			C	TOLUENE	9.80	PPM	88	3419148	
37			C	E-BENZ	9.30	PPM	168	2160126	
38	Mar 07,91	11:42	A	BENZENE	0.03	PPM	59	6184	TSA0106GC
38			A	UNKNOWN	0.02	PPM	29	3708	
39	Mar 07,91	13:46	A	UNKNOWN	0.11	PPM	70	25969	TSA0107GC
39			A	UNKNOWN	0.12	PPM	78	29811	
39			A	UNKNOWN	0.04	PPM	155	8752	
40	Mar 07,91	14:02	A	UNKNOWN	0.17	PPM	69	42452	TSA0108GC
40			A	UNKNOWN	0.17	PPM	79	41409	
41	Mar 07,91	14:18	A		0.00	PPB	30	0	ROOM BLANK
42	Mar 07,91	14:57	A	UNKNOWN	0.67	PPM	68	165069	TSA0109GC
42			A	UNKNOWN	0.45	PPM	80	110800	
43	Mar 07,91	15:14	A	UNKNOWN	0.78	PPM	68	129385	TSA0109GC
43			A	UNKNOWN	0.47	PPM	80	115480	
44	Mar 07,91	15:29	A		0.00	PPB	30	0	ROOM BLANK
45	Mar 07,91	15:34	A		0.00	PPB	30	0	TSA0110GC
46	Mar 07,91	16:18	A	UNKNOWN	0.02	PPM	70	3800	TSA0111GC
46			A	UNKNOWN	0.03	PPM	28	8553	
47	Mar 12,91	09:33	C	BENZENE	9.80	PPM	36	6690	BTEX

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
47			C	TOLUENE	9.80	PPM	49	1090526	
47			C	E-BENZ	9.30	PPM	60	2159076	
48	Mar 12,91	09:49	C	BENZENE	9.80	PPM	59	2528863	BTEX
48			C	TOLUENE	9.80	PPM	88	3628292	
48			C	E-BENZ	9.30	PPM	167	2450320	
49	Mar 12,91	10:06	C	BENZENE	9.80	PPM	59	2734764	BTEX
49			C	TOLUENE	9.80	PPM	86	3898490	
49			C	E-BENZ	9.30	PPM	166	2469111	
50	Mar 12,91	10:23	A	BENZENE	0.10	PPM	59	27228	ROOM BLANK
50			A	TOLUENE	0.04	PPM	86	14555	
51	Mar 12,91	10:41	A	TOLUENE	0.02	PPM	86	6688	TSA0112GC
52	Mar 12,91	11:22	A		0.00	PPB	30	0	TSA0113GC
53	Mar 12,91	11:43	A	UNKNOWN	0.01	PPM	69	1615	TSA1701GC
54	Mar 12,91	11:39	A	UNKNOWN	0.03	PPM	70	8814	TSA0114GC
54			A	UNKNOWN	0.04	PPM	77	10622	
55	Mar 12,91	12:36	A	UNKNOWN	0.01	PPM	70	2525	TSA0115GC
56	Mar 12,91	13:32	C	BENZENE	9.80	PPM	59	3660335	BTEX
56			C	TOLUENE	9.80	PPM	86	3719414	
56			C	E-BENZ	9.30	PPM	168	3628642	
57	Mar 12,91	13:48	A	BENZENE	0.10	PPM	59	22848	TSA0116GC
57			A	UNKNOWN	0.11	PPM	69	42321	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
57			A	UNKNOWN	0.13 PPM	77	50030	
58	Mar 12,91	14:03	A	BENZENE	0.00 PPM	59	423	TSA0117GC
58			A	UNKNOWN	0.04 PPM	70	13635	
58			A	UNKNOWN	0.04 PPM	77	15588	
59	Mar 12,91	14:20	A	BENZENE	11499.13 PPM	60	-1395	TSA0118GC
59			A	UNKNOWN	0.04 PPM	70	13883	
59			A	UNKNOWN	0.08 PPM	77	24295	
60	Mar 12,91	14:24	A	UNKNOWN	0.02 PPM	70	8596	TSA0118GC
60			A	UNKNOWN	0.04 PPM	77	19701	
61	Mar 12,91	14:40	A	UNKNOWN	0.02 PPM	70	6894	TSA0119GC
61			A	UNKNOWN	0.03 PPM	77	11400	
62	Mar 12,91	14:56	A		0.00 PPB	30	0	ROOM BLANK
63	Mar 12,91	15:42	A	UNKNOWN	0.02 PPM	70	5625	TSA0120GC
63			A	UNKNOWN	0.03 PPM	76	10828	
64	Mar 12,91	16:28	A	UNKNOWN	0.03 PPM	62	11131	TSA0121GC
64			A	UNKNOWN	0.04 PPM	77	15405	
65	Mar 13,91	08:45	C	BENZENE	9.80 PPM	50	168085	BTEX
65			C	TOLUENE	9.80 PPM	62	2051210	
65			C	E-BENZ	9.30 PPM	[illegible]	3415182	
66	Mar 13,91	09:16	C	BENZENE	9.80 PPM	56	2754998	BTEX
66			C	TOLUENE	9.80 PPM	88	3954664	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
66			C	E-BENZ	9.30 PPM	168	2679101	
67	Mar 13,91	09:32	A	BENZENE	0.02 PPM	52	18555	ROOM BLANK
67			A	TOLUENE	0.02 PPM	87	7258	
68	Mar 13,91	10:13	A	UNKNOWN	0.02 PPM	68	6913	TSA0901GC
69	Mar 13,91	10:32	A	UNKNOWN	0.05 PPM	68	15163	TSA0902GC
69			A	UNKNOWN	0.01 PPM	81	4153	
70	Mar 13,91	11:14	A	UNKNOWN	0.35 PPM	68	97561	TSA0903GC
70			A	UNKNOWN	0.19 PPM	81	52858	
71	Mar 13,91	12:03	A	UNKNOWN	0.02 PPM	67	5854	TSA0122GC
72	Mar 13,91	12:36	C	BENZENE	9.80 PPM	52	3808024	BTEX
72			C	TOLUENE	9.80 PPM	82	5786049	
72			C	E-BENZ	9.30 PPM	167	3797872	
73	Mar 13,91	13:36	A		0.00 PPB	30	0	TSA0123GC
74	Mar 13,91	14:05	A	UNKNOWN	0.04 PPM	67	15186	TSA0904GC
74			A	UNKNOWN	0.02 PPM	79	7057	
75	Mar 13,91	15:09	A		0.00 PPB	30	0	ROOM BLANK
76	Mar 13,91	16:01	A	UNKNOWN	0.62 PPM	67	266692	TSA0905GC
76			A	UNKNOWN	0.37 PPM	79	141908	
77	Mar 13,91	16:24	A	UNKNOWN	0.18 PPM	67	69963	-TSA1754GC
77			A	UNKNOWN	0.18 PPM	79	73918	
78	Mar 14,91	13:50	C	BENZENE	9.80 PPM	48	194269	BTEX

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
78			C	TOLUENE	9.80 PPM	60	1544428	
78			C	E-BENZ	9.30 PPM	91	2587284	
79	Mar 14,91	14:06	C	BENZENE	9.80 PPM	60	2489386	BTEX
79			C	TOLUENE	9.80 PPM	88	3658093	
79			C	E-BENZ	9.30 PPM	170	2493090	
80	Mar 14,91	14:24	A	BENZENE	0.18 PPM	60	45567	TSA0906GC
80			A	UNKNOWN	0.82 PPM	68	208269	
80			A	UNKNOWN	0.42 PPM	81	105813	
80			A	TOLUENE	0.35 PPM	86	81751	
81	Mar 18,91	08:37	C	BENZENE	9.80 PPM	51	768131	BTEX
81			C	TOLUENE	9.80 PPM	92	1225874	
81			C	E-BENZ	9.30 PPM	92	2725451	
82	Mar 18,91	08:51	C	BENZENE	9.80 PPM	60	2678731	BTEX
82			C	TOLUENE	9.80 PPM	88	3860674	
82			C	E-BENZ	9.30 PPM	169	2602004	
83	Mar 18,91	11:49	A	UNKNOWN	0.86 PPM	82	233813	TSA0907GC
83			A	UNKNOWN	1.14 PPM	83	312028	
83			A	UNKNOWN	0.05 PPM	152	13529	
84	Mar 18,91	15:41	A	UNKNOWN	0.21 PPM	66	57122	TSA0909GC
84			A	UNKNOWN	0.12 PPM	81	32404	
85	Mar 19,91	09:14	C	BENZENE	9.80 PPM	49	226974	BTEX

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
85			C	TOLUENE	9.80	PPM	59	3776324	
85			C	E-BENZ	9.30	PPM	87	6105366	
86	Mar 19,91	09:31	C	BENZENE	9.80	PPM	59	3764911	BTEX
86			C	TOLUENE	9.80	PPM	87	5608678	
86			C	E-BENZ	9.30	PPM	167	3222115	
87	Mar 19,91	10:03	A	UNKNOWN	1.39	PPM	46	525609	C-TET STD
87			A	BENZENE	0.12	PPM	58	85128	
87			A	UNKNOWN	1.03	PPM	68	36927	
87			A	UNKNOWN	2.90	PPM	80	2650900	
88	Mar 19,91	10:11	A	UNKNOWN	0.04	PPM	46	14392	BLANK
88			A	UNKNOWN	0.12	PPM	60	25803	
89	Mar 19,91	10:15	A	BENZENE	8.22	PPM	59	3350907	BTEX
89			A	TOLUENE	8.73	PPM	87	4995148	
89			A	E-BENZ	7.89	PPM	167	3131347	
90	Mar 19,91	10:31	A	BENZENE	0.34	PPM	60	129912	ROOM BLANK
90			A	TOLUENE	0.22	PPM	88	124205	
90			A	E-BENZ	0.06	PPM	167	[illegible]	
91	Mar 19,91	12:11	A	BENZENE	0.07	PPM	60	27421	TSA0908GC
91			A	UNKNOWN	1.01	PPM	68	389910	
91			A	TOLUENE	0.69	PPM	85	394385	
92	Mar 19,91	12:27	A	UNKNOWN	0.26	PPM	68	99948	TSA0910GC

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
92			A	TOLUENE	0.16	PPM	86	91057	
93	Mar 19,91	14:55	A	UNKNOWN	0.16	PPM	62	89276	TSA0911GC
93			A	UNKNOWN	0.09	PPM	83	38319	
94	Mar 19,91	15:58	A	UNKNOWN	0.06	PPM	28	32871	TSA0912GC
95	Mar 20,91	08:28	C	BENZENE	9.80	PPM	49	3201424	BTEX
95			C	TOLUENE	9.80	PPM	60	2211256	
95			C	E-BENZ	9.30	PPM	89	4504243	
96	Mar 20,91	08:44	C	BENZENE	9.80	PPM	60	3427640	BTEX
96			C	TOLUENE	9.80	PPM	88	5070691	
96			C	E-BENZ	9.30	PPM	168	3319542	
97	Mar 20,91	14:44	A	UNKNOWN	0.29	PPM	67	103543	TSA0914GC
97			A	UNKNOWN	0.08	PPM	155	88514	
98	Mar 20,91	15:31	A	UNKNOWN	0.25	PPM	67	88624	TSA0913GC
99	Mar 21,91	08:13	C	BENZENE	9.80	PPM	49	3223877	BTEX
99			C	TOLUENE	9.80	PPM	60	3522820	
99			C	E-BENZ	9.30	PPM	88	3524240	
100	Mar 21,91	08:29	C	BENZENE	9.80	PPM	59	3226733	BTEX
100			C	TOLUENE	9.80	PPM	87	5534832	
100			C	E-BENZ	9.30	PPM	166	4958222	
101	Mar 21,91	09:21	A	BENZENE	0.02	PPM	59	9682	TSA0915GC
101			A	UNKNOWN	0.17	PPM	67	66618	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
102	Mar 21,91	10:08	A	UNKNOWN	0.08	PPM	68	31329	TSA0916GC
103	Mar 21,91	10:30	A		0.00	PPB	30	0	ROOM BLANK
104	Mar 21,91	11:09	A		0.00	PPB	30	0	TSA0917GC
105	Mar 21,91	12:04	A		0.00	PPB	30	0	TSA0918GC
106	Mar 27,91	13:00	C	BENZENE	9.80	PPM	48	16168	BTEX
106			C	TOLUENE	9.80	PPM	59	[illegible]	
106			C	E-BENZ	9.30	PPM	[illegible]	3484814	
107	Mar 27,91	13:04	C	BENZENE	9.80	PPM	59	3614816	BTEX
107			C	TOLUENE	9.80	PPM	87	5402305	
107			C	E-BENZ	9.30	PPM	167	3267412	
108	Mar 27,91	13:22	A	UNKNOWN	0.04	PPM	42	16186	TSF0503GC
108			A	UNKNOWN	182.78	PPM	73	67420734	
109	Apr 03,91	07:57	C	BENZENE	9.80	PPM	62	-144	BTEX
109			C	TOLUENE	9.80	PPM	72	477694	
109			C	E-BENZ	9.30	PPM	119	674083	
110	Apr 03,91	08:31	C	BENZENE	9.80	PPM	84	2611857	BTEX
110			C	TOLUENE	9.80	PPM	94	4424190	
110			C	E-BENZ	9.30	PPM	182	3031730	
111	Apr 03,91	08:36	C	BENZENE	9.80	PPM	72	1891402	BTEX
111			C	TOLUENE	9.80	PPM	103	1048553	
111			C	E-BENZ	9.30	PPM	200	1848590	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
112	Apr 03,91	08:42	A		0.00	PPB	30	0	ambient
113	Apr 03,91	08:49	C	BENZENE	9.80	PPM	70	1694109	BTEX
113			C	TOLUENE	9.80	PPM	103	2317532	
113			C	E-BENZ	9.30	PPM	128	1555003	
114	Apr 03,91	09:09	A		0.00	PPB	30	0	ambient
115	Apr 03,91	09:16	C	BENZENE	9.80	PPM	70	1925105	BTEX
115			C	TOLUENE	9.80	PPM	103	2782358	
115			C	E-BENZ	9.30	PPM	128	1691585	
116	Apr 03,91	09:40	A		0.00	PPB	30	0	ambient
117	Apr 08,91	09:34	C	BENZENE	9.80	PPM	52	499604	BTEX
117			C	TOLUENE	9.80	PPM	84	881724	
117			C	E-BENZ	9.30	PPM	97	884191	
118	Apr 08,91	09:41	C	BENZENE	9.80	PPM	61	1242681	BTEX
118			C	TOLUENE	9.80	PPM	81	1700291	
118			C	E-BENZ	9.30	PPM	176	1050345	
119	Apr 08,91	09:48	C	BENZENE	9.80	PPM	60	1657535	BTEX
119			C	TOLUENE	9.80	PPM	89	2320694	
119			C	E-BENZ	9.30	PPM	121	1452251	
120	Apr 08,91	10:38	A		0.00	PPB	30	0	TSA0116GCL
121	Apr 08,91	10:55	A		0.00	PPB	30	0	TSA0917GCL
122	Apr 08,91	11:15	A		0.00	PPB	30	0	TSA0907GCL

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
123	Apr 08,91	11:31	A		0.00	PPB	30	0	TSA0208GCL
124	Apr 08,91	11:42	A		0.00	PPB	30	0	TSA0515GC
125	Apr 08,91	12:03	A		0.00	PPB	30	0	TSA0516GC
126	Apr 08,91	13:10	C	BENZENE	9.80	PPM	58	2025666	BTEX
126			C	TOLUENE	9.80	PPM	85	3282020	
126			C	E-BENZ	9.30	PPM	163	2401670	
126			C	O-XYLENE	9.60	PPM	706	132343	
127	Apr 08,91	13:26	A		0.00	PPB	30	0	TSA0518GC
128	Apr 08,91	13:42	A		0.00	PPB	30	0	TSA0519GC
129	Apr 08,91	13:57	A		0.00	PPB	30	0	TSA0521GC
130	Apr 08,91	14:16	A		0.00	PPB	30	0	TSA0522GC
131	Apr 08,91	14:31	A		0.00	PPB	30	0	TSA0523GC
132	Apr 08,91	14:42	A		0.00	PPB	30	0	TSA0525GC
133	Apr 08,91	15:03	A		0.00	PPB	30	0	TSA0529GC
134	Apr 08,91	15:21	A		0.00	PPB	30	0	TSA0612GC
135	Apr 08,91	15:38	A		0.00	PPB	30	0	TSA0502GC
136	Apr 08,91	15:54	A		0.00	PPB	30	0	TSA0509GC
137	Apr 09,91	08:08	C	BENZENE	9.80	PPM	56	682779	BTEX
137			C	TOLUENE	9.80	PPM	72	958788	
137			C	E-BENZ	9.30	PPM	111	1413844	
137			C	O-XYLENE	9.60	PPM	223	1010100	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
138	Apr 09,91	08:13	C	BENZENE	9.80	PPM	65	1314793	BTEX
138			C	TOLUENE	9.80	PPM	88	1897226	
138			C	E-BENZ	9.30	PPM	195	1204468	
139	Apr 09,91	08:17	C	BENZENE	9.80	PPM	62	1612492	BTEX
139			C	TOLUENE	9.80	PPM	85	2275720	
139			C	E-BENZ	9.30	PPM	180	1393432	
140	Apr 09,91	08:36	A	UNKNOWN	0.06	PPM	59	3186	TSA0511GC
140			A	UNKNOWN	0.03	PPM	86	3580	
141	Apr 09,91	08:40	C	BENZENE	9.80	PPM	58	1817709	BTEX
141			C	TOLUENE	9.80	PPM	87	2579594	
141			C	E-BENZ	9.30	PPM	167	1550252	
142	Apr 09,91	08:56	A	TOLUENE	0.05	PPM	86	13494	TSA0512GC
143	Apr 09,91	09:12	A		0.00	PPB	30	0	TSA0503GC
144	Apr 09,91	09:30	A		0.00	PPB	30	0	TSA0501GC
145	Apr 09,91	09:46	A		0.00	PPB	30	0	TSA0504GC
146	Apr 09,91	10:06	A		0.00	PPB	30	0	TSA0505GC
147	Apr 09,91	10:24	A		0.00	PPB	30	0	TSA0506GC
148	Apr 09,91	10:40	A		0.00	PPB	30	0	TSA0507GC
149	Apr 09,91	11:01	A		0.00	PPB	30	0	TSA0508GC
150	Apr 09,91	11:15	A		0.00	PPB	30	0	TSA0510GC
151	Apr 09,91	11:29	A		0.00	PPB	30	0	TSA0513GC

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
152	Apr 09,91	11:44	A		0.00	PPB	30	0	TSA0514GC
153	Apr 09,91	11:56	A		0.00	PPB	30	0	TSA0517GC
154	Apr 09,91	13:08	C	BENZENE	9.80	PPM	58	2292874	BTEX
154			C	TOLUENE	9.80	PPM	86	3603370	
154			C	E-BENZ	9.30	PPM	165	2313867	
155	Apr 09,91	13:24	A		0.00	PPB	30	0	TSA0520GC
156	Apr 09,91	13:41	A		0.00	PPB	30	0	TSA0524GC
157	Apr 09,91	13:58	A		0.00	PPB	30	0	TSA0534GC
158	Apr 09,91	14:14	A		0.00	PPB	30	0	[illegible]
159	Apr 09,91	14:27	A		0.00	PPB	30	0	TSA0532GC
160	Apr 09,91	14:44	A		0.00	PPB	30	0	TSA0535GC
161	Apr 09,91	14:58	A		0.00	PPB	30	0	TSA0536GC
162	Apr 09,91	15:13	A		0.00	PPB	30	0	TSA0537GC
163	Apr 09,91	15:27	A		0.00	PPB	30	0	TSA1702GC
164	Apr 09,91	15:40	A		0.00	PPB	30	0	TSA0601GC
165	Apr 10,91	08:57	C	BENZENE	9.80	PPM	56	57301	BTEX
165			C	TOLUENE	9.80	PPM	71	920605	
165			C	E-BENZ	9.30	PPM	110	1415835	
165			C	O-XYLENE	9.60	PPM	220	952358	
166	Apr 10,91	09:03	C	BENZENE	9.80	PPM	63	1633898	BTEX
166			C	TOLUENE	9.80	PPM	95	2339513	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
166			C	E-BENZ	9.30	PPM	187	1453574	
167	Apr 10,91	09:09	C	BENZENE	9.80	PPM	81	2048998	BTEX
167			C	TOLUENE	9.80	PPM	90	2895109	
167			C	E-BENZ	9.30	PPM	175	1944290	
168	Apr 10,91	09:13	C	BENZENE	9.80	PPM	59	2415442	BTEX
168			C	TOLUENE	9.80	PPM	98	3532998	
168			C	E-BENZ	9.30	PPM	170	2138110	
169	Apr 10,91	09:30	A	BENZENE	0.09	PPM	59	23466	TSA0603GC
169			A	TOLUENE	0.05	PPM	87	18134	
170	Apr 10,91	09:46	A		0.00	PPB	30	0	TSA0604GC
171	Apr 10,91	10:03	A		0.00	PPB	30	0	TSA0605GC
172	Apr 10,91	10:18	A		0.00	PPB	30	0	TSA0606GC
173	Apr 10,91	10:36	A		0.00	PPB	30	0	TSA0607GC
174	Apr 10,91	10:50	A		0.00	PPB	30	0	TSA0608GC
175	Apr 10,91	11:04	A		0.00	PPB	30	0	TSA0801GC
176	Apr 10,91	11:17	A		0.00	PPB	30	0	TSA0803GC
177	Apr 10,91	11:32	A		0.00	PPB	30	0	TSA0804GC
178	Apr 10,91	11:46	A		0.00	PPB	30	0	TSA0805GC
179	Apr 10,91	11:58	A		0.00	PPB	30	0	TSA0806GC
180	Apr 10,91	12:25	C	BENZENE	9.80	PPM	59	3414194	BTEX
180			C	TOLUENE	9.80	PPM	87	5370971	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
180			C	E-BENZ	9.30	PPM	167	3353598	
181	Apr 10,91	12:42	A	BENZENE	0.01	PPM	59	3714	TSA0807GC
181			A	TOLUENE	0.02	PPM	87	11351	
182	Apr 10,91	12:58	A		0.00	PPB	30	0	TSA0808GC
183	Apr 10,91	13:13	A		0.00	PPB	30	0	TSA0527GC
184	Apr 10,91	13:28	A		0.00	PPB	30	0	TSA0528GC
185	Apr 10,91	13:45	A		0.00	PPB	30	0	TSA0529GC
186	Apr 10,91	14:02	A		0.00	PPB	30	0	TSA0531GC
187	Apr 10,91	14:23	A		0.00	PPB	30	0	TSA0533GC
188	Apr 10,91	14:37	A		0.00	PPB	30	0	TSA0602GC
189	Apr 10,91	14:51	A		0.00	PPB	30	0	TSA0614GC
190	Apr 10,91	15:06	A		0.00	PPB	30	0	TSA0616GC
191	Apr 10,91	15:22	A	TOLUENE	0.00	PPM	86	18876	TSA0511GC
192	Apr 10,91	15:41	A		0.00	PPB	30	0	TSA0534GC
193	Apr 10,91	16:08	A		0.00	PPB	30	0	TSA0603GC
194	Apr 15,91	09:16	C	BENZENE	9.80	PPM	56	60786	BTEX
194			C	TOLUENE	9.80	PPM	[illegible]	2875029	
194			C	E-BENZ	9.30	PPM	[illegible]	5437957	
194			C	O-XYLENE	9.60	PPM	[illegible]	4100161	
195	Apr 15,91	09:20	C	BENZENE	9.80	PPM	[illegible]	[illegible]	BTEX
195			C	TOLUENE	9.80	PPM	87	3460968	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
195			C	E-BENZ	9.30 PPM	168	2504086	
195			C	O-XYLENE	9.60 PPM	489	98711	
196	Apr 15,91	09:37	A	TOLUENE	0.07 PPM	87	24215	TSA0609GC
197	Apr 15,91	09:57	A		0.00 PPB	30	0	TSA0610GC
198	Apr 15,91	10:15	A		0.00 PPB	30	0	TSA0611GC
199	Apr 15,91	10:29	A		0.00 PPB	30	0	TSA0612GC
200	Apr 15,91	10:44	A		0.00 PPB	30	0	TSA0613GC
201	Apr 15,91	10:52	A		0.00 PPB	30	0	TSA0615GC
202	Apr 15,91	11:13	A		0.00 PPB	30	0	TSA0702GC
203	Apr 15,91	11:28	A		0.00 PPB	30	0	TSA0703GC
204	Apr 15,91	11:40	A		0.00 PPB	30	0	TSA0704GC
205	Apr 15,91	11:54	A		0.00 PPB	30	0	TSA0802GC
206	Apr 17,91	08:55	C	BENZENE	9.80 PPM	53	190784	BTEX
206			C	TOLUENE	9.80 PPM	88	683425	
206			C	E-BENZ	9.30 PPM	169	1185228	
207	Apr 17,91	08:58	C	BENZENE	9.80 PPM	54	426928	BTEX
207			C	TOLUENE	9.80 PPM	92	792718	
207			C	E-BENZ	9.30 PPM	165	1047055	
207			C	O-XYLENE	9.60 PPM	186	210348	
208	Apr 17,91	09:10	C	BENZENE	9.80 PPM	53	1844583	BTEX
208			C	TOLUENE	9.80 PPM	87	2317424	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
208			C	E-BENZ	9.30 PPM	168	1462416	
209	Apr 17,91	09:26	A	BENZENE	0.03 PPM	58	6272	TSA0701GC
210	Apr 17,91	09:38	A		0.00 PPB	30	0	TSA0705GC
211	Apr 17,91	09:53	A		0.00 PPB	30	0	TSA0706GC
212	Apr 17,91	10:08	A		0.00 PPB	30	0	TSA0707GC
213	Apr 17,91	10:22	A		0.00 PPB	30	0	TSA0708GC
214	Apr 17,91	10:36	A		0.00 PPB	30	0	TSA1703GC
215	Apr 17,91	10:51	A		0.00 PPB	30	0	TSA0709GC
216	Apr 17,91	11:04	A		0.00 PPB	30	0	TSA0710GC
217	Apr 17,91	11:18	A		0.00 PPB	30	0	TSA0711GC
218	Apr 17,91	11:32	A		0.00 PPB	30	0	TSA0712GC
219	Apr 17,91	11:45	A		0.00 PPB	30	0	TSA0713GC
220	Apr 17,91	12:00	A		0.00 PPB	30	0	TSA0714GC
221	Apr 17,91	12:55	A		0.00 PPB	30	0	TSB0715GC
222	Apr 17,91	13:10	C	BENZENE	9.80 PPM	58	269857	BTEX
222			C	TOLUENE	9.80 PPM	85	439017	
222			C	E-BENZ	9.30 PPM	164	3119714	
222			C	O-XYLENE	9.60 PPM	711	122612	
223	Apr 17,91	13:26	A		0.00 PPB	30	0	TSA0301GC
224	Apr 17,91	13:40	A		0.00 PPB	30	0	TSA0302GC
225	Apr 17,91	13:55	A		0.00 PPB	30	0	TSA0303GC

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT	RT	AREA	NAME
226	Apr 17,91	14:09	A		0.00 PPB	30	0	TSA0304GC
227	Apr 17,91	14:23	A		0.00 PPB	30	0	TSA0305GC
228	Apr 17,91	14:38	A		0.00 PPB	30	0	TSA0306GC
229	Apr 17,91	14:52	A		0.00 PPB	30	0	TSA0307GC
230	Apr 17,91	15:06	A		0.00 PPB	30	0	TSA0308GC
231	Apr 17,91	15:20	A		0.00 PPB	30	0	TSA0309GC
232	Apr 17,91	15:34	A		0.00 PPB	30	0	TSA0311GC
233	Apr 18,91	08:44	C	BENZENE	9.80 PPM	53	65285	BTEX
233			C	TOLUENE	9.80 PPM	82	889743	
233			C	E-BENZ	9.30 PPM	105	1396697	
233			C	O-XYLENE	9.60 PPM	204	1008248	
234	Apr 18,91	08:51	C	BENZENE	9.80 PPM	52	1372705	BTEX
234			C	TOLUENE	9.80 PPM	93	2340966	
234			C	E-BENZ	9.30 PPM	181	1440459	
235	Apr 18,91	08:55	C	BENZENE	9.80 PPM	59	1838845	BTEX
235			C	TOLUENE	9.80 PPM	87	2623513	
235			C	E-BENZ	9.30 PPM	166	1517453	
236	Apr 18,91	09:13	A	BENZENE	0.05 PPM	58	10841	TSA0312GC
236			A	TOLUENE	0.03 PPM	88	7655	
237	Apr 18,91	09:30	A		0.00 PPB	30	0	TSA0310GC
238	Apr 18,91	09:45	A		0.00 PPB	30	0	TSA0313GC

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
239	Apr 18,91	10:01	A		0.00	PPB	30	0	TSA0314GC
240	Apr 18,91	10:19	A		0.00	PPB	30	0	TSA0315GC
241	Apr 18,91	10:31	A		0.00	PPB	30	0	TSA0316GC
242	Apr 18,91	10:45	A	UNKNOWN	0.03	PPB	29	5943	TSA0317GC
243	Apr 18,91	11:00	A		0.00	PPB	30	0	TSA0318GC
244	Apr 18,91	11:16	A		0.00	PPB	30	0	TSA0319GC
245	Apr 18,91	11:33	A		0.00	PPB	30	0	TSA0320GC
246	Apr 18,91	11:47	A		0.00	PPB	30	0	TSA0401GC
247	Apr 18,91	12:46	C	BENZENE	9.80	PPM	58	313621	BTEX
247			C	TOLUENE	9.80	PPM	85	447202	
247			C	E-BENZ	9.30	PPM	164	317632	
247			C	O-XYLENE	9.60	PPM	711	89378	
248	Apr 18,91	13:03	A	TOLUENE	0.02	PPM	85	11017	TSA0402GC
249	Apr 18,91	13:19	A	UNKNOWN	0.01	PPM	29	3091	TSA0403GC
250	Apr 18,91	13:35	A		0.00	PPB	30	0	TSA0404GC
251	Apr 18,91	13:51	A		0.00	PPB	30	0	TSA0405GC
252	Apr 18,91	14:02	A		0.00	PPB	30	0	TSA1704GC
253	Apr 18,91	14:25	A		0.00	PPB	30	0	TSA1705GC
254	Apr 22,91	07:58	C	BENZENE	9.80	PPM	52	325305	BTEX
254			C	TOLUENE	9.80	PPM	85	272548	
254			C	E-BENZ	9.30	PPM	98	1555111	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
254			C	O-XYLENE	9.60	PPM	192	1352618	
255	Apr 22,91	08:06	C	BENZENE	9.80	PPM	61	1356434	BTEX
255			C	TOLUENE	9.80	PPM	82	1682417	
255			C	E-BENZ	9.30	PPM	174	1576786	
256	Apr 22,91	08:10	C	BENZENE	9.80	PPM	59	1525732	BTEX
256			C	TOLUENE	9.80	PPM	82	2060163	
256			C	E-BENZ	9.30	PPM	168	1567948	
257	Apr 22,91	08:28	A	BENZENE	0.05	PPM	58	8315	ROOM BLANK
257			A	TOLUENE	0.01	PPM	85	2447	
258	Apr 22,91	09:01	A	UNKNOWN	2.44	PPM	67	378905	TSA1001GC
258			A	UNKNOWN	0.81	PPM	84	125925	
259	Apr 22,91	09:19	A	UNKNOWN	3.39	PPM	67	527081	TSA1002GC
259			A	TOLUENE	0.77	PPM	85	168804	
260	Apr 22,91	09:31	A	UNKNOWN	13.19	PPM	67	2045498	TSA1003GC
260			A	UNKNOWN	2.92	PPM	83	302718	
261	Apr 22,91	09:39	A	UNKNOWN	2.92	PPM	67	454443	TSA1004GC
261			A	UNKNOWN	2.25	PPM	83	350297	
262	Apr 22,91	09:50	A	UNKNOWN	2.54	PPM	67	395560	TSA1005GC
262			A	TOLUENE	0.61	PPM	85	122975	
263	Apr 22,91	10:02	A	UNKNOWN	3.62	PPM	67	563395	TSA1006GC-
263			A	UNKNOWN	0.75	PPM	83	116921	

*** ANALYSIS *** PRESS <esc> TO STOP OR ANY OTHER KEY TO CONTINUE ***

TRACE	DATE	TIME	C/A	PEAK	CONCNT		RT	AREA	NAME
264	Apr 22,91	10:11	A	UNKNOWN	2.63	PPM	67	408932	TSA1007GC
264			A	UNKNOWN	0.72	PPM	84	111914	
265	Apr 22,91	10:21	A	UNKNOWN	0.75	PPM	67	113127	TSA1008GC
265			A	TOLUENE	0.21	PPM	85	44976	
266	Apr 22,91	10:31	A	UNKNOWN	0.78	PPM	67	120723	TSA1009GC
266			A	TOLUENE	0.19	PPM	85	40766	
267	Apr 22,91	10:41	A		0.00	PPB	30	0	TSA1010GC
268	Apr 22,91	10:53	A	UNKNOWN	0.48	PPM	67	74465	TSA1011GC
268			A	TOLUENE	0.19	PPM	86	40298	
269	Apr 22,91	11:05	A	UNKNOWN	0.97	PPM	67	151031	TSA1012GC
269			A	TOLUENE	0.32	PPM	86	67126	
270	Apr 22,91	11:14	A	UNKNOWN	0.04	PPM	67	5680	TSA1013GC
270			A	TOLUENE	0.57	PPM	87	120720	
271	Apr 22,91	11:25	A	TOLUENE	0.50	PPM	87	108112	TSA1014GC
272	Apr 22,91	11:35	A	TOLUENE	0.50	PPM	87	105255	TSA1015GC
273	Apr 22,91	11:52	C	BENZENE	9.80	PPM	59	2298505	BTEX
273			C	TOLUENE	9.80	PPM	86	4421871	
273			C	E-BENZ	9.30	PPM	168	4035724	
273			C	O-XYLENE	9.60	PPM	720	142450	
274	Apr 22,91	12:39	A	TOLUENE	0.23	PPM	85	112112	TSA1016GC
275	Apr 22,91	12:49	A	TOLUENE	0.17	PPM	85	82083	TSA1017GC

*** ANALYSIS TRACE	DATE	TIME	*** PRESS <esc> C/A	PEAK	TO STOP CONCNT	OR ANY RT	OTHER KEY TO AREA	CONTINUE *** NAME
276	Apr 22,91	13:01	A	TOLUENE	0.16 PPM	86	81605	TSA1018GC
277	Apr 22,91	13:14	A	UNKNOWN	0.06 PPM	67	17632	TSA1019GC
277			A	TOLUENE	0.21 PPM	86	105067	
278	Apr 22,91	13:27	A	TOLUENE	0.12 PPM	86	[illegible]	TSA1020GC
279	Apr 22,91	13:41	A	TOLUENE	0.05 PPM	86	[illegible]	TSA1706GC
280	Apr 22,91	13:52	A	TOLUENE	0.10 PPM	85	[illegible]	TSA1101GC
281	Apr 22,91	14:04	A	TOLUENE	0.04 PPM	85	[illegible]	TSA1102GC
282	Apr 22,91	14:18	A	TOLUENE	0.13 PPM	85	[illegible]	TSA1103GC
283	Apr 22,91	14:29	A	TOLUENE	0.10 PPM	85	[illegible]	TSA1104GC
284	Apr 22,91	14:41	A	TOLUENE	0.10 PPM	85	[illegible]	TSA1105GC
285	Apr 23,91	08:13	C	BENZENE	9.80 PPM	[illegible]	[illegible]	BTEX
285			C	TOLUENE	9.80 PPM	[illegible]	[illegible]	
285			C	E-BENZ	9.30 PPM	[illegible]	[illegible]	
285			C	O-XYLENE	9.20 PPM	[illegible]	[illegible]	
286	Apr 23,91	08:18	C	BENZENE	9.80 PPM	[illegible]	[illegible]	BTEX
286			C	TOLUENE	9.80 PPM	[illegible]	[illegible]	
286			C	E-BENZ	9.30 PPM	[illegible]	1483628	
287	Apr 23,91	08:25	C	BENZENE	9.80 PPM	59	2198547	BTEX
287			C	TOLUENE	9.80 PPM	87	3371572	
287			C	E-BENZ	9.30 PPM	169	1948421	
288	Apr 23,91	08:44	A	BENZENE	0.06 PPM	58	12644	TSA1106GC

*** ANALYSIS TRACE	DATE	TIME	*** PRESS <esc> C/A	PEAK	TO STOP CONCNT	OR ANY RT	OTHER KEY TO AREA	CONTINUE *** NAME
288			A	TOLUENE	0.52 PPM	85	178868	
289	Apr 23,91	08:53	A	TOLUENE	0.07 PPM	85	[illegible]	TSA1107GC
290	Apr 23,91	[illegible]	A	TOLUENE	0.06 PPM	86	[illegible]	TSA1108GC
291	Apr 23,91	09:21	A	TOLUENE	0.05 PPM	87	15945	TSA1109GC
292	Apr 23,91	[illegible]	A		0.00 PPM	30	0	TSA1110GC
293	Apr 23,91	[illegible]	A		0.00 PPM	30	0	TSA1111GC
294	Apr 23,91	[illegible]	A	TOLUENE	0.02 PPM	85	5516	TSA1207GC
295	Apr 23,91	[illegible]	A		0.00 PPM	30	0	TSA0710GCL
296	Apr 23,91	10:55	A	UNKNOWN	[illegible] PPM	[illegible]	27174	TSA0907GCL2
296			A	UNKNOWN	[illegible] PPM	[illegible]	57813	
297	Apr 23,91	11:06	A		0.00 PPM	30	0	TSA0116GCL2
298	Apr 23,91	11:17	A	UNKNOWN	[illegible] PPM	[illegible]	802014	TSA1708GC
298			A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
299	Apr 23,91	11:28	A	UNKNOWN	[illegible] PPM	[illegible]	1155477	TSA0317GCL
299			A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
300	Apr 23,91	11:41	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	TSA0403GCL
300			A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
301	Apr 23,91	11:54	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	TSA1004GCL
301			A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
302	Apr 23,91	12:36	C	BENZENE	9.80 PPM	58	3211847	BTEX
302			C	TOLUENE	9.80 PPM	86	5195988	

*** ANALYSIS TRACE	DATE	TIME	*** PRESS <esc> C/A	PEAK	TO STOP CONCNT	OR ANY RT	OTHER KEY TO AREA	CONTINUE *** NAME
302			C	E-BENZ	9.30 PPM	166	3294093	
302			C	O-XYLENE	9.20 PPM	719	[illegible]	
303	Apr 23,91	13:10	A	UNKNOWN	[illegible] PPM	67	1740366	TSA1003GCL
303			A	UNKNOWN	[illegible] PPM	81	[illegible]	
304	Apr 23,91	13:20	A	UNKNOWN	4.70 PPM	67	1540064	TSA1709GC
304			A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
305	Apr 23,91	13:32	A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	TSA1006GCL
305			A	UNKNOWN	[illegible] PPM	[illegible]	[illegible]	
306	Apr 23,91	13:41	A	BENZENE	[illegible] PPM	[illegible]	[illegible]	BTEX STD
306			A	TOLUENE	[illegible] PPM	[illegible]	[illegible]	
306			A	E-BENZ	[illegible] PPM	[illegible]	[illegible]	
307	Apr 23,91	13:45	A	BENZENE	[illegible] PPM	[illegible]	[illegible]	BTEX STD
307			A	TOLUENE	[illegible] PPM	[illegible]	[illegible]	
307			A	E-BENZ	[illegible] PPM	[illegible]	[illegible]	
308	Apr 23,91	13:49	A	BENZENE	[illegible] PPM	[illegible]	[illegible]	BTEX STD
308			A	TOLUENE	[illegible] PPM	[illegible]	[illegible]	
308			A	E-BENZ	[illegible] PPM	[illegible]	[illegible]	
309	Apr 23,91	13:54	A	BENZENE	[illegible] PPM	[illegible]	[illegible]	BTEX STD
309			A	TOLUENE	[illegible] PPM	[illegible]	[illegible]	
309			A	E-BENZ	9.56 PPM	[illegible]	[illegible]	
309			A	UNKNOWN	0.20 PPM	716	65698	

```
*** SCENTOGRAPH             OPERATING PARAMETERS

 1-Calibrant          ( Enter up to 12 letters) ... BTEX
 2-Sample Time                 ( 0 - 999 Sec) ... 5
 3-Delay Time               ( 0.0 - 2.0 Sec) ... 0.5
 4-Desorption Time          ( 0.0 - 4.0 Sec) ... 4.0
 5-Inhibit Time               ( 0 - 999 Sec) ... 30
 6-Oven Temperature         ( 30 - 180 xC ) ... 100
 7-Chart Duration              ( 1 - 40 Min) ... 15
 8-Analyses per Calibration       ( 1 - 99) ... 99
 9-Auto Analysis Duration     ( 0 - 999 Min) ... MANUAL
10-Backflush Option          ( 0=off, 1=on) ... BACKFL OFF
11-Column            ( Enter up to 12 letters) ... 10%SP-1000
12-Detector           ( Enter up to 8 letters) ... AID
13-Number of Calibration Peaks      ( 1 - 16) ... 4
14-Peak Number ....................................
   Substance Name     ( Enter up to 8 letters) ...
   Concentration Range       ( 1=PPM, 0=PPB) ...
   Calibration Concentration .......................
   Alarm Level Concentration .......................
   Second Alarm Level Concentration ................

15-Next Screen      16-Channel Information Setup Screen
ENTER FIELD TO BE UPDATED?

*** SCENTOGRAPH             OPERATING PARAMETERS - SECONDARY SCREEN

 17-Final temperature           ( 30 - 180 xC) ... 100
 18-Temperature slope duration in seconds      ... 0
 19-Initial Gain for sample runs               ... 1.0
 20-Time Weight Average      (0-off, 1 - 24) ... 0
 21-Column Pressure in PSI's                   ... 20
 22-Enable alarm              ( 0=off, 1=on ) ... OFF
 23-Enable External Purge     ( 0=off, 1-300) ... OFF
 24-Compound database name                     ...
 25-Compound database entry         ( 1 - 100) ...
```

APPENDIX D

RESULTS TABLES FOR CHEMICAL ANALYSES

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC DATA

AREA	TSA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: NO VOC DET	VER: NO VOC DET	VER: NO VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1401V	TSA1402V	TSA1403V	TSA1501V	TSA1501V2	TSA1502V2	TSA1502VR2
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SDG NUMBER	TSA1401VS	TSA1401VS	TSA1403V	TSA1401VS	TSA1403V	TSA1403V	TSA1401VS
FIELD MEASUREMENTS							
Depth (ft)	14-14.5	7.5-8.5	8-9	8-8.5	7.5-8.5	16.5-17.5	17-17.5
TARGET COMPOUNDS							
Chloromethane	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
Bromomethane	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
Vinyl Chloride	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
Chloroethane	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
Methylene Chloride	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	51 J
Acetone	8 J	---	11 UR	7 J	11 UR	11 UR	10 UJ
Carbon Disulfide	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
1,1-Dichloroethene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
1,1-Dichloroethane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
1,2-Dichloroethene_(total)	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Chloroform	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
1,2-Dichloroethane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
2-Butanone	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
1,1,1-Trichloroethane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Carbon Tetrachloride	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Vinyl Acetate	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
Bromodichloromethane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
1,2-Dichloropropane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
cis-1,3-Dichloropropene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Trichloroethene	2 J	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Dibromochloromethane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
1,1,2-Trichloroethane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Benzene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Trans-1,3-Dichloropropene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Bromoform	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
4-Methyl-2-Pentanone	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
2-Hexanone	10 UJ	---	11 UR	10 UJ	11 UR	11 UR	10 UJ
Tetrachloroethene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
1,1,2,2-Tetrachloroethane	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Toluene	5 UJ	2 J	5 UR	5 UJ	6 UR	6 UR	2 J

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: NO VOC DET	VER: NO VOC DET	VER: NO VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1401V	TSA1402V	TSA1403V	TSA1501V	TSA1501V2	TSA1502V2	TSA1502VR2
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SDG NUMBER	TSA1401VS	TSA1401VS	TSA1403V	TSA1401VS	TSA1403V	TSA1403V	TSA1401VS
Chlorobenzene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Ethylbenzene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Styrene	5 UJ	---	5 UR	5 UJ	6 UR	6 UR	5 UJ
Xylene (total)	5 UJ	---	4 JX	5 UJ	6 UR	6 UR	5 UJ
Dilution Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total (Allowed) Hold Time	22(14)d*	13(14)d	36(14)d*	22(14)d*	36(14)d*	36(14)d*	28(14)d*

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1503V	TSA1504V	TSA1505V	TSA1506V	TSA1507V	TSA1508V	TSA1509V
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SDG NUMBER	TSA1401VS	TSA1401VS	TSA1401VS	TSA1403V	TSA1403V	TSA1403V	TSA1403V
FIELD MEASUREMENTS							
Depth (ft)	17-17.5	8.5-9.5	7-8	3.5-4.5	4-5	3-4	3-4.5
TARGET COMPOUNDS							
Chloromethane	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
Bromomethane	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
Vinyl Chloride	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
Chloroethane	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
Methylene Chloride	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Acetone	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
Carbon Disulfide	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
1,1-Dichloroethene	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
1,1-Dichloroethane	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
1,2-Dichloroethene_(total)	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Chloroform	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
1,2-Dichloroethane	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
2-Butanone	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
1,1,1-Trichloroethane	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Carbon Tetrachloride	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Vinyl Acetate	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
Bromodichloromethane	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
1,2-Dichloropropane	7 J	---	---	6 UR	5 UR	6 UR	5 UR
cis-1,3-Dichloropropene	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Trichloroethene	5 J	---	---	6 UR	5 UR	6 UR	5 UR
Dibromochloromethane	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
1,1,2-Trichloroethane	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Benzene	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Trans-1,3-Dichloropropene	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Bromoform	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
4-Methyl-2-Pentanone	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
2-Hexanone	10 UJ	---	---	11 UR	11 UR	11 UR	11 UR
Tetrachloroethene	4 J	---	---	6 UR	5 UR	6 UR	5 UR
1,1,2,2-Tetrachloroethane	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Toluene	5 UJ	2 J	2 J	6 UR	5 UR	6 UR	5 UR

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1503V	TSA1504V	TSA1505V	TSA1506V	TSA1507V	TSA1508V	TSA1509V
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SDG NUMBER	TSA1401VS	TSA1401VS	TSA1401VS	TSA1403V	TSA1403V	TSA1403V	TSA1403V
Chlorobenzene	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Ethylbenzene	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Styrene	5 UJ	---	---	6 UR	5 UR	6 UR	5 UR
Xylene (total)	5 UJ	---	---	4 JX	5 UR	6 UR	3 JX
Dilution Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total (Allowed) Hold Time	22(14)d*	13(14)d	13(14)d	36(14)d*	36(14)d*	36(14)d*	36(14)d*

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC DATA (Continued)

AREA	TSA	TSA
LOCATION	VER: VOC DET	TSA
TYPE OF LOCATION	BIASED	COMPOSITE/DRUM
SAMPLE NUMBER	TSA1510V	TSA2201V
MEDIA	SOIL	WATER
UNITS	ug/kg	ug/L
SDG NUMBER	TSA1403V	TSA1403V
FIELD MEASUREMENTS		
Depth (ft)	3.5-4.5	-
TARGET COMPOUNDS		
Chloromethane	11 UR	---
Bromomethane	11 UR	---
Vinyl Chloride	11 UR	---
Chloroethane	11 UR	---
Methylene Chloride	5 UR	0.6 J
Acetone	11 UR	---
Carbon Disulfide	5 UR	---
1,1-Dichloroethene	5 UR	---
1,1-Dichloroethane	5 UR	---
1,2-Dichloroethene_(total)	5 UR	---
Chloroform	5 UR	---
1,2-Dichloroethane	5 UR	---
2-Butanone	11 UR	0.6 J
1,1,1-Trichloroethane	5 UR	---
Carbon Tetrachloride	5 UR	---
Vinyl Acetate	11 UR	---
Bromodichloromethane	5 UR	---
1,2-Dichloropropane	5 UR	---
cis-1,3-Dichloropropene	5 UR	---
Trichloroethene	5 UR	---
Dibromochloromethane	5 UR	---
1,1,2-Trichloroethane	5 UR	---
Benzene	5 UR	---
Trans-1,3-Dichloropropene	5 UR	---
Bromoform	5 UR	---
4-Methyl-2-Pentanone	11 UR	---
2-Hexanone	11 UR	---
Tetrachloroethene	5 UR	---
1,1,2,2-Tetrachloroethane	5 UR	---
Toluene	5 UR	5

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC DATA (Continued)

AREA	TSA	TSA
LOCATION	VER: VOC DET	TSA
TYPE OF LOCATION	BIASED	COMPOSITE/DRUM
SAMPLE NUMBER	TSA1510V	TSA2201V
MEDIA	SOIL	WATER
UNITS	ug/kg	ug/L
SDG NUMBER	TSA1403V	TSA1403V
Chlorobenzene	5 UR	---
Ethylbenzene	5 UR	---
Styrene	5 UR	---
Xylene (total)	5 UR	---
Dilution Factor	1.000	1.000
Total (Allowed) Hold Time	36(14)d*	9(14)d

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC REPLICATE DATA

AREA	TSA
LOCATION	QC
TYPE OF LOCATION	REPLICATE
SAMPLE NUMBER	TSA1901V
MEDIA	SOIL
UNITS	ug/kg
SDG NUMBER	TSA1403V
FIELD MEASUREMENTS	
Depth (ft)	3-4.5
TARGET COMPOUNDS	
Chloromethane	11 UR
Bromomethane	11 UR
Vinyl Chloride	11 UR
Chloroethane	11 UR
Methylene Chloride	5 UR
Acetone	11 UR
Carbon Disulfide	5 UR
1,1-Dichloroethene	5 UR
1,1-Dichloroethane	5 UR
1,2-Dichloroethene_(total)	5 UR
Chloroform	5 UR
1,2-Dichloroethane	5 UR
2-Butanone	11 UR
1,1,1-Trichloroethane	5 UR
Carbon Tetrachloride	5 UR
Vinyl Acetate	11 UR
Bromodichloromethane	5 UR
1,2-Dichloropropane	5 UR
cis-1,3-Dichloropropene	5 UR
Trichloroethene	5 UR
Dibromochloromethane	5 UR
1,1,2-Trichloroethane	5 UR
Benzene	5 UR
Trans-1,3-Dichloropropene	5 UR
Bromoform	5 UR
4-Methyl-2-Pentanone	11 UR
2-Hexanone	11 UR
Tetrachloroethene	5 UR
1,1,2,2-Tetrachloroethane	5 UR
Toluene	5 UR

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC REPLICATE DATA (Continued)

AREA	TSA
LOCATION	QC
TYPE OF LOCATION	REPLICATE
SAMPLE NUMBER	TSA1901V
MEDIA	SOIL
UNITS	ug/kg
SDG NUMBER	TSA1403V
Chlorobenzene	5 UR
Ethylbenzene	5 UR
Styrene	5 UR
Xylene (total)	5 JX
Dilution Factor	1.000
Total (Allowed) Hold Time	36(14)d*

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC RINSATE DATA

AREA	TSA
LOCATION	QC
TYPE OF LOCATION	RINSATE
SAMPLE NUMBER	TSA2001VR
MEDIA	WATER
UNITS	ug/L
SDG NUMBER	TSA1401VW
TARGET COMPOUNDS	
Chloroform	37
Xylene (total)	4 J
Dilution Factor	1.000
Total (Allowed) Hold Time	11(14)d

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC TRIP BLANK DATA

AREA	TSA	TSA	TSA	TSA	TSA
LOCATION	QC	QC	QC	QC	QC
TYPE OF LOCATION	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK
SAMPLE NUMBER	TSA2101VT	TSA2102VT	TSA2103VT	TSA2103VT	TSA2104VT
MEDIA	WATER	WATER	WATER	WATER	WATER
UNITS	ug/L	ug/L	ug/L	ug/L	ug/kg
SDG NUMBER	TSA1401VW	TSA1401VW	TSA1403V	TSA2103VT	TSA1403V
TARGET COMPOUNDS					
Chloromethane	10 UJ	---	10 UR	---	---
Bromomethane	10 UJ	---	10 UR	---	---
Vinyl Chloride	10 UJ	---	10 UR	---	---
Chloroethane	10 UJ	---	10 UR	---	---
Methylene Chloride	5 UJ	---	1 J	---	1 J
Acetone	10 UJ	---	10 UR	---	---
Carbon Disulfide	5 UJ	---	5 UR	---	---
1,1-Dichloroethene	5 UJ	---	5 UR	---	---
1,1-Dichloroethane	5 UJ	---	5 UR	---	---
1,2-Dichloroethene_(total)	5 UJ	---	5 UR	---	---
Chloroform	44 J	46	30 J	37	33
1,2-Dichloroethane	5 UJ	---	5 UR	---	---
2-Butanone	10 UJ	---	10 UR	---	---
1,1,1-Trichloroethane	5 UJ	---	5 UR	---	---
Carbon Tetrachloride	5 UJ	---	5 UR	---	---
Vinyl Acetate	10 UJ	---	10 UR	---	---
Bromodichloromethane	5 UJ	---	5 UR	---	---
1,2-Dichloropropane	5 UJ	---	5 UR	---	---
cis-1,3-Dichloropropene	5 UJ	---	5 UR	---	---
Trichloroethene	5 UJ	---	5 UR	---	---
Dibromochloromethane	5 UJ	---	5 UR	---	---
1,1,2-Trichloroethane	5 UJ	---	5 UR	---	---
Benzene	5 UJ	---	5 UR	---	---
Trans-1,3-Dichloropropene	5 UJ	---	5 UR	---	---
Bromoform	5 UJ	---	5 UR	---	---
4-Methyl-2-Pentanone	10 UJ	---	10 UR	---	---
2-Hexanone	10 UJ	---	10 UR	---	---
Tetrachloroethene	5 UJ	---	5 UR	---	---
1,1,2,2-Tetrachloroethane	5 UJ	---	5 UR	---	---
Toluene	5 UJ	---	5 UR	---	---

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - VOLATILE ORGANIC TRIP BLANK DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA
LOCATION	QC	QC	QC	QC	QC
TYPE OF LOCATION	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK	TRIP BLANK
SAMPLE NUMBER	TSA2101VT	TSA2102VT	TSA2103VT	TSA2103VT	TSA2104VT
MEDIA	WATER	WATER	WATER	WATER	WATER
UNITS	ug/L	ug/L	ug/L	ug/L	ug/kg
SDG NUMBER	TSA1401VW	TSA1401VW	TSA1403V	TSA2103VT	TSA1403V
Chlorobenzene	5 UJ	---	5 UR	---	---
Ethylbenzene	5 UJ	---	5 UR	---	---
Styrene	5 UJ	---	5 UR	---	---
Xylene (total)	5 UJ	---	5 UR	---	---
Dilution Factor	1.000	1.000	1.000	1.000	1.000
Total (Allowed) Hold Time	26(14)d*	12(14)d	21(14)d*	6(14)d	9(14)d

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - INORGANIC DATA

AREA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1301M	TSA1302M	TSA1303M	TSA1304M	TSA1305M	TSA1306M
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SDG NUMBER	TSA1301M	TSA1301M	TSA1301M	TSA1301M	TSA1301M	TSA1301M
FIELD MEASUREMENTS						
Depth (ft)	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
ANALYTES						
Aluminum	19400	17800	17400	15200	15700	14700
Antimony	19.4 BNJ	28.1 BNJ	21.5 BNJ	27.3 BNJ	15.1 BNJ	21.8 BNJ
Arsenic	18.5 BJ	17.1 UUJ	17.1 UUJ	17.1 UUJ	17.1 UUJ	18.3 BJ
Barium	248	261	285	295	233	214
Beryllium	1.4	1.4	2.2	1.4	1.4	1.3
Cadmium	1.8 BNUJ	1.5 BNUJ	1.4 BNUJ	1.0 BNUJ	1.6 BNUJ	1.7 BNUJ
Calcium	73200	76600	158000	72900	80000	59900
Chromium	34.0	33.7	28.1	31.1	32.6	33.4
Cobalt	14.1	12.8	15.0	11.7	13.0	11.3
Copper	17.4	11.4	0.85 BU	10.5	9.7	12.4
Cyanide						
Iron	22600 J	20700 J	17000 J	19400 J	19400 J	19800 J
Lead	15.6	13.9	11.5	12.2	13.8	15.5
Magnesium	12900 J	13400 J	13800 J	13700 J	13800 J	13500 J
Manganese	548	477	331	418	390	411
Mercury	0.05 BU	0.03 BU	0.04 BU	0.04 BU	0.04 BU	0.04 BU
Nickel	27.4	27.5	21.3	27.9	26.5	27.5
Potassium	2730	2630	2500	2560	2750	2300
Selenium	18.9 BJ	18.4 UUJ	18.4 UUJ	18.4 UUJ	18.4 UUJ	18.3 UUJ
Silver	0.60 BNUJ	1.8 BNUJ	1.8 BNUJ	0.60 BNUJ	0.60 BNUJ	0.59 UNUJ
Sodium	978 B	1470	1040	1290	815 B	433 B
Thallium	38.0 BUJ	37.3 BUJ	29.3 BUJ	3.2 UUJ	45.8 BUJ	30.0 BUJ
Vanadium	37.0	37.3	31.9	38.8	40.8	38.0
Zinc	67.6 EJ	63.2 EJ	50.8 EJ	64.5 EJ	62.7 EJ	64.7 EJ
% Solids	83.2	83.4	78.1	83.5	82.5	84.0
Total (Allowed) Hold Time[a]	19(180)d	19(180)d	19(180)d	19(180)d	19(180)d	19(180)d
Total (Allowed) Hold Time[b]	14(26)d	14(26)d	14(26)d	14(26)d	14(26)d	14(26)d
Total (Allowed) Hold Time[c]	21(180)d	21(180)d	21(180)d	21(180)d	21(180)d	21(180)d

a. ICP
b. CVAAS
c. GFAAS

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - INORGANIC DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	BACKGROUND	BACKGROUND	BACKGROUND	BACKGROUND	VER: NO VOC DET	VER: NO VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1307M	TSA1308M	TSA1309M	TSA1310M	TSA1401M	TSA1402M
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SDG NUMBER	TSA1301M	TSA1301M	TSA1301M	TSA1301M	TSA1401M	TSA1401M
FIELD MEASUREMENTS						
Depth (ft)	0-0.5	0-0.5	0-0.5	0-0.5	14-14.5	7.5-8.5
ANALYTES						
Aluminum	15500	18200	20200	19800	21800	17800
Antimony	24.1 BNJ	27.0 BNJ	25.4 BNJ	27.7 BNJ	33.9 NJ	21.0 BNJ
Arsenic	30.3 BJ	17.0 UUJ	17.0 UUJ	17.0 UUJ	20.4 BJ	17.2 UUJ
Barium	239	260	337	328	309	260
Beryllium	1.2	1.8	2.2	2.2	1.4	0.92 B
Cadmium	1.5 BNUJ	1.5 BNUJ	1.8 BNUJ	1.3 BNUJ	1.5 BU	1.9 BU
Calcium	55400	119000	153000	148000	51300	31100
Chromium	39.2	35.3	34.5	33.6	37.5	33.1
Cobalt	15.7	9.4 B	13.7	12.2	16.7 UJ	14.8 UJ
Copper	12.8	6.7	5.3 U	45.1	18.2 *J	20.2 *J
Cyanide						
Iron	20500 J	19500 J	20000 J	19600 J	25200	23800
Lead	15.5	15.0	14.1	16.8	18.1	16.9
Magnesium	13700 J	13100 J	14800 J	14500 J	11900 J	10200 J
Manganese	466	359	361	330	502	493
Mercury	0.04 BU	0.04 BU	0.04 BU	0.04 BU	0.03 UJ	0.04 U
Nickel	29.3	24.3	30.3	31.0	31.1	30.1
Potassium	2570	3150	3950	3840	4250	3220
Selenium	18.4 UUJ	18.2 UUJ	18.3 UUJ	18.3 UUJ	18.3 UUJ	18.5 UUJ
Silver	1.8 BNUJ	0.59 UNUJ	0.60 BNUJ	0.59 UNUJ	1.8 BNUJ	2.2 BNUJ
Sodium	432 B	399 B	369 B	362 B	450 B	733 B
Thallium	24.3 BUJ	45.2 BUJ	33.9 BUJ	51.8 BUJ	13.3 BUJ	7.2 BUJ
Vanadium	40.0	33.6	34.3	33.8	40.6	34.3
Zinc	66.5 EJ	62.4 EJ	70.6 EJ	95.9 EJ	96.9 EJ	84.4 EJ
% Solids	83.3	78.8	72.8	74.6	82.9	89.2
Total (Allowed) Hold Time[a]	19(180)d	19(180)d	19(180)d	19(180)d	54(180)d	41(180)d
Total (Allowed) Hold Time[b]	14(26)d	14(26)d	14(26)d	14(26)d	28(26)d*	15(26)d
Total (Allowed) Hold Time[c]	21(180)d	21(180)d	21(180)d	21(180)d	67(180)d	54(180)d

a. ICP
b. CVAAS
c. GFAAS

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - INORGANIC DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: NO VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1403M	TSA1501M	TSA1502M	TSA1503M	TSA1504M	TSA1505M
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
SDG NUMBER	TSA1301M	TSA1401M	TSA1401M	TSA1401M	TSA1401M	TSA1401M
FIELD MEASUREMENTS						
Depth (ft)	8-9	8-8.5	17-17.5	17-17.5	8.5-9.5	7-8
ANALYTES						
Aluminum	18100	14400	22000	19800	23600	18200
Antimony	28.6 BNJ	16.1 BNJ	13.5 BNJ	25.2 BNJ	41.1 NJ	26.5 BNJ
Arsenic	33.7 BJ	11.2 UUJ	17.0 UUJ	16.9 UUJ	17.2 UUJ	17.1 UUJ
Barium	263	176	265	269	312	277
Beryllium	1.2	0.87	1.3	1.2	1.4	1.1
Cadmium	1.4 BNUJ	1.3 BU	2.2 BU	1.0 BU	1.7 BU	2.0 BU
Calcium	51000	28500	40200	41500	50500	48300
Chromium	35.3	25.2	36.4	37.0	35.2	32.9
Cobalt	14.9	10.7 UJ	13.2 UJ	15.8 UJ	15.5 UJ	13.0 UJ
Copper	33.2	16.4 *J	28.3 *J	19.4 *J	17.6 *J	16.7 *J
Cyanide						
Iron	23300 J	16900	25800	24800	24200	22600
Lead	17.8	20.7	16.5	19.2	19.6	19.2
Magnesium	11700 J	13100 J	11600 J	12000 J	12500 J	11600 J
Manganese	465	403	541	513	641	449
Mercury	0.04 BU	0.03 UJ	0.03 UJ	0.03 UJ	0.3 U	0.3 U
Nickel	33.2	30.5	35.1	32.2	30.6	27.9
Potassium	3490	4070	4610	3970	3900	3000 E
Selenium	18.1 UUJ	18.4 UUJ	18.3 UUJ	18.2 UUJ	18.5 UUJ	18.5 UUJ
Silver	0.59 BNUJ	2.0 BNUJ	0.59 BNUJ	0.59 BNUJ	1.8 BNUJ	2.2 BNUJ
Sodium	543 B	878 B	588 B	623 B	281 B	834 B
Thallium	37.1 BUJ	32.1 BUJ	23.6 BUJ	31.8 BUJ	29.4 BUJ	27.5 BUJ
Vanadium	38.6	39.3	41.2	40.7	39.1	33.3
Zinc	97.7 EJ	99.8 EJ	105 EJ	102 EJ	95.5 EJ	86.8 EJ
% Solids	89.2	84.8	88.1	83.6	89.4	86.0
Total (Allowed) Hold Time[a]	20(180)d	54(180)d	54(180)d	54(180)d	41(180)d	41(180)d
Total (Allowed) Hold Time[b]	15(26)d	28(26)d*	28(26)d*	28(26)d*	15(26)d	15(26)d
Total (Allowed) Hold Time[c]	22(180)d	67(180)d	67(180)d	67(180)d	54(180)d	54(180)d

a. ICP
b. CVAAS
c. GFAAS

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - INORGANIC DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	TSA
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	COMPOSITE/DRUM
SAMPLE NUMBER	TSA1506M	TSA1507M	TSA1508M	TSA1509M	TSA1510M	TSA2201M
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
SDG NUMBER	TSA1301M	TSA1301M	TSA1301M	TSA1301M	TSA1301M	TSA2201M
FIELD MEASUREMENTS						
Depth (ft)	3.5-4.5	4-5	3-4	3-4.5	3.5-4.5	-
ANALYTES						
Aluminum	24400	24500	19000	18300	22000	37900
Antimony	28.1 BNJ	15.9 BNJ	28.9 BNJ	21.8 BNJ	15.3 BNJ	65.0 B
Arsenic	16.8 UUJ	17.1 UUJ	17.0 UUJ	17.0 UUJ	17.2 UUJ	85.9 UUJ
Barium	326	401	282	278	264	545
Beryllium	1.4	1.4	0.84 B	0.87 B	0.89 B	2.9 BU
Cadmium	1.8 BNUJ	1.4 BNUJ	1.2 BNUJ	3.5 BNUJ	1.4 BNUJ	5.8 BU
Calcium	52700	53200	28900	33400	30800	115000
Chromium	38.8	40.5	30.9	34.1	38.4	107 NJ
Cobalt	17.6	23.9	13.3	19.5	14.5	29.0 BU
Copper	21.5	22.7	20.0	17.4	17.7	53.9
Cyanide						
Iron	25800 J	26500 J	24600 J	24400 J	24800 J	39300
Lead	17.6	19.1	14.9	15.6	15.2	85.9 BJ
Magnesium	12700 J	12800 J	9800 J	10200 J	10400 J	21800
Manganese	732	1230	537	488	158	1050
Mercury	0.04 BU	0.03 BU	0.03 BU	0.03 BU	0.04 BU	---
Nickel	32.2	36.3	29.9	27.6	26.2	107
Potassium	4040	4340	2910	2970	3310	8290
Selenium	18.0 UUJ	18.4 UUJ	18.3 UUJ	23.2 BJ	18.5 UUJ	92.5 UUJ
Silver	0.58 UNUJ	0.60 BNUJ	0.60 BNUJ	1.8 BNUJ	0.60 BNUJ	9.1 BNUJ
Sodium	317 B	488 B	696 B	980 B	863 B	50400
Thallium	14.5 BUJ	31.1 BUJ	24.2 BUJ	23.0 BUJ	27.4 BUJ	---
Vanadium	40.4	44.6	30.7	32.4	41.6	96.6
Zinc	87.6 EJ	89.9 EJ	82.0 EJ	79.8 EJ	75.1 EJ	260 EJ
% Solids	88.2	88.7	90.3	92.0	92.0	
Total (Allowed) Hold Time[a]	20(180)d	20(180)d	20(180)d	20(180)d	20(180)d	23(180)d
Total (Allowed) Hold Time[b]	15(26)d	15(26)d	15(26)d	15(26)d	15(26)d	14(26)d
Total (Allowed) Hold Time[c]	22(180)d	22(180)d	22(180)d	22(180)d	22(180)d	15(180)d

a. ICP
b. CVAAS
c. GFAAS

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - INORGANIC FIELD BLANK DATA

AREA	TSA
LOCATION	QC
TYPE OF LOCATION	FIELD BLANK
SAMPLE NUMBER	TSA1801MF
MEDIA	WATER
UNITS	ug/L
SDG NUMBER	TSA1801MF
ANALYTES	
Aluminum	---
Antimony	---
Arsenic	85.9 UJ
Barium	5.4 BU
Beryllium	---
Cadmium	---
Calcium	68.6 BU
Chromium	---
Cobalt	---
Copper	---
Cyanide	
Iron	6.2 BU
Lead	2.0 BU
Magnesium	42.2 BU
Manganese	6.3 BUJ
Mercury	0.08 BU
Nickel	---
Potassium	---
Selenium	92.5 UJ
Silver	23.3 BNJ
Sodium	225 BU
Thallium	16.3 UJ
Vanadium	---
Zinc	13.7 BU
Total (Allowed) Hold Time[a]	26(180)d
Total (Allowed) Hold Time[b]	14(26)d
Total (Allowed) Hold Time[c]	19(180)d

a. ICP
b. CVAAS
c. GFAAS

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - INORGANIC REPLICATE DATA

AREA	TSA
LOCATION	QC
TYPE OF LOCATION	REPLICATE
SAMPLE NUMBER	TSA1901M
MEDIA	SOIL
UNITS	mg/kg
SDG NUMBER	TSA1301M
FIELD MEASUREMENTS	
Depth (ft)	3-4.5
ANALYTES	
Aluminum	20800
Antimony	28.9 BNJ
Arsenic	17.0 UUJ
Barium	287
Beryllium	0.94 B
Cadmium	2.5 BNUJ
Calcium	39400
Chromium	37.4
Cobalt	16.8
Copper	17.2
Cyanide	
Iron	24300 J
Lead	14.5
Magnesium	10700 J
Manganese	536
Mercury	0.04 BU
Nickel	28.9
Potassium	3460
Selenium	27.3 BJ
Silver	0.59 UNUJ
Sodium	954 B
Thallium	10.1 BUJ
Vanadium	38.4
Zinc	77.4 EJ
% Solids	91.8
Total (Allowed) Hold Time[a]	20(180)d
Total (Allowed) Hold Time[b]	15(26)d
Total (Allowed) Hold Time[c]	22(180)d

a. ICP
b. CVAAS
c. GFAAS

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - INORGANIC RINSATE DATA

AREA	TSA
LOCATION	QC
TYPE OF LOCATION	RINSATE
SAMPLE NUMBER	TSA2001MR
MEDIA	WATER
UNITS	ug/L
SDG NUMBER	TSA1801MF
ANALYTES	
Aluminum	---
Antimony	---
Arsenic	85.9 UJ
Barium	4.6 BU
Beryllium	---
Cadmium	3.0 BU
Calcium	136 B
Chromium	---
Cobalt	---
Copper	2.5 BU
Cyanide	
Iron	9.2 BU
Lead	2.2 BU
Magnesium	83.2 BU
Manganese	2.0 BUJ
Mercury	0.08 BU
Nickel	---
Potassium	---
Selenium	92.5 UJ
Silver	3.2 BNJ
Sodium	292 BU
Thallium	16.3 UJ
Vanadium	---
Zinc	12.3 BU
Total (Allowed) Hold Time[a]	26(180)d
Total (Allowed) Hold Time[b]	14(26)d
Total (Allowed) Hold Time[c]	19(180)d

a. ICP
b. CVAAS
c. GFAAS

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - PCB DATA

AREA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: NO VOC DET	VER: NO VOC DET	VER: NO VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1401B	TSA1402B	TSA1403B	TSA1501B	TSA1502B	TSA1503B
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SDG NUMBER	TSA1401B	TSA1402B	TSA1403B	TSA1401B	TSA1401B	TSA1401B
FIELD MEASUREMENTS						
Depth (ft)	14-14.5	7.5-8.5	8-9	8-8.5	17-17.5	17-17.5
TARGET COMPOUNDS						
None detected.						
Total (Allowed) Hold Time	8(14)d	8(14)d	13(14)d	8(14)d	8(14)d	8(14)d
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - PCB DATA (Continued)

AREA	TSA	TSA	TSA	TSA	TSA	TSA
LOCATION	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET	VER: VOC DET
TYPE OF LOCATION	BIASED	BIASED	BIASED	BIASED	BIASED	BIASED
SAMPLE NUMBER	TSA1504B	TSA1505B	TSA1506B	TSA1507B	TSA1508B	TSA1509B
MEDIA	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
SDG NUMBER	TSA1402B	TSA1402B	TSA1403B	TSA1403B	TSA1403B	TSA1403B
FIELD MEASUREMENTS						
Depth (ft)	8.5-9.5	7-8	3.5-4.5	4-5	3-4	3-4.5
TARGET COMPOUNDS						
None detected.						
Total (Allowed) Hold Time	8(14)d	8(14)d	13(14)d	13(14)d	13(14)d	13(14)d
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - PCB DATA (Continued)

AREA	TSA	TSA
LOCATION	VER: VOC DET	TSA
TYPE OF LOCATION	BIASED	COMPOSITE/DRUM
SAMPLE NUMBER	TSA1510B	TSA2201B
MEDIA	SOIL	WATER
UNITS	ug/kg	ug/L
SDG NUMBER	TSA1403B	TSA2201B
FIELD MEASUREMENTS		
Depth (ft)	3.5-4.5	-
TARGET COMPOUNDS		
None detected.		
Total (Allowed) Hold Time	13(14)d	9(7)d
Dilution Factor	1.0	1.0

TABLE _._._ TSA SOIL OVERBURDEN SAMPLING - PCB REPLICATE DATA

AREA	TSA
LOCATION	QC
TYPE OF LOCATION	REPLICATE
SAMPLE NUMBER	TSA1901B
MEDIA	SOIL
UNITS	ug/kg
SDG NUMBER	TSA1403B
FIELD MEASUREMENTS	
Depth (ft)	3-4.5
TARGET COMPOUNDS	
None detected.	
Total (Allowed) Hold Time	13(14)d
Dilution Factor	1.0

APPENDIX E

Laboratory Report from the RML

EG&G Idaho

"Providing research and development services to the government"

INTEROFFICE CORRESPONDENCE

Date: May 10, 1991

To: R. G. Schwaller, MS 1407

From: T. J. Haney, MS 7111

Subject: GAMMA ANALYSIS OF SIXTEEN TSA SOIL OVERBURDEN SAMPLES-TJH-47-91

Fourteen soil samples and two water samples from the TSA Soil Overburden study were submitted to the Radiation Measurements Laboratory (RML) for an analysis to determine whether any gamma-ray-emitting radionuclide contaminants were present. The soils were counted in a 500 cm^3 squat jar soil geometry for two hours and the water samples were counted for sixteen hours in a 540 ml liquid bottle geometry. The samples were counted on RML gamma spectrometers and were analyzed by the gamma-spectrometric analysis program VAX/CBAT. The results are reported on the attached Table 1.

It should be noted that Cs-137 exists in surface soils (~top 5cm) due to fallout. Typical concentrations are approximately .8 pCi/gm, but can vary by a factor of two. The "1986 Environmental Monitoring Program Report for the Idaho National Engineering Laboratory (DOE/ID-12082 [86])", prepared by RESL is an excellent reference for information related to background radioactivities found in both on and off-site soils.

The analysis results were carefully examined by experienced and trained gamma spectroscopists. The results reported are those radionuclide results which were found by the analyst to be true-positive and "real" according to criteria found in RML Procedure DM-1: "Evaluation and Verification of Data for Radionuclide Identification/Selection."

The total uncertainty reported for gamma-emitters includes the statistical uncertainty and the estimate of the uncertainty in the sample geometry (5%) and in the detector efficiency (5%). The uncertainties were propagated in quadrature and are expressed as one standard deviation.

vax

cc: J. R. Bishoff
E. W. Killian
L. D. Koeppen
W. R. Paskey
C. L. Rowsell
E. R. Spruill
Central Files
T. J. Haney File

Table 1

RML GAMMA-RAY ANALYSIS RESULTS OF
TSA SOIL OVERBURDEN SAMPLES

Sample ID	RML ID	Manmade Radionuclides	Activity (T) (pCi/gm)
TSA1401G	D2040391025	None Detected	N/A
TSA1402G	D1041291030	None Detected	N/A
TSA1403G	D3042591024	None Detected	N/A
TSA1501G	D1040391024	Cs-137	(1.1±.3)E-01
TSA1502G	D2040391022	Cs-137	(1.2±.2)E-01
TSA1503G	D1040391022	None Detected	N/A
TSA1504G	D1041591025	None Detected	N/A
TSA1505G	D2041291031	None Detected	N/A
TSA1506G	D2042591023	None Detected	N/A
TSA1507G	D1042591022	None Detected	N/A
TSA1508G	D3042691028	None Detected	N/A
TSA1509G	D3042591034	Cs-137	(4.0±.8)E-02
TSA1510G	D1042591028	None Detected	N/A
TSA1901G	D1042691027	None Detected	N/A

RML GAMMA RAY ANALYSIS RESULTS OF
TSA SOIL OVERBURDEN LIQUID SAMPLES

Sample Id	RML Id	Manmade Radionuclides	Activity (T) (pCi/ml)
TSA2001GR	A6041591032	None Detected	N/A
TSA2201G	A5050691035	None Detected	N/A